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SEWER-GAS POISONING.

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IN the houses of the present day containing all the modern improvements there is constant danger that the air from the soil pipes or drains will enter the house in consequence of defective plumbing; and that this danger is a very real one is shown by the frequency with which oil of peppermint, introduced into the drain of such a house, betrays itself by its odor in one or more of the rooms. Even a small leak in the soil-pipe, in consequence of the steady escape of sewer-gas, will suffice to contaminate a large air space, especially when the air is not rapidly changed —as, for instance, when the house is tightly shut up on a winter night.

Although it is a difficult thing to determine the exact cause of individual cases of disease, yet it is certainly a very widespread, if not a universal, belief in the medical profession that the escape of sewer-gas into a house may give rise to sickness. The mere fact that in a house with defective plumbing a certain form of disease occurs is, of course, no proof that the former is the cause of the latter. It may either be a mere coincidence, or the sewer-gas may predispose the system to, or even aggravate[1] the disease, without actually causing it. In order to make it probable that the defective plumbing, and the consequent escape of sewer-gas, is the cause of the disease, the two things must occur together many times, and the oftener that this concurrence takes place the stronger becomes the probability that there is a causal connection between them, and this probability becomes still stronger if, after the plumbing has been repaired, the disease more or less quickly disappears.[2]

The character of the sickness resulting from sewer-gas poisoning varies greatly, depending in part upon the different susceptibility to different diseases of the inmates of the house, and in greater part on the varying composition of the sewer-gas itself. An analysis of sewer-gas taken from well-ventilated sewers shows it to contain oxygen, nitrogen, carbonic acid, and ammonia in proportions not varying essentially from those of the atmosphere; and an analysis of sewer-gas taken from badly ventilated sewers (which is much more poisonous than that from well-ventilated ones) shows a diminution of oxygen, an increase of nitrogen, ammonia, and carbonic acid, and the presence of hydrogen sulphide, marsh-gas, and organic vapors of a carbo-ammoniacal composition. Large quantities of bacteria have also been found in sewer-gas.

Sewer-gas (which is merely a convenient name for the atmosphere of sewers) is, therefore, of a very complex and variable composition, and its toxic elements are not certainly known. In cases of acute asphyxia from very foul sewer-gas the symptoms so strongly resemble those of poisoning by hydrogen sulphide that this gas is probably the cause of such attacks; but it is very doubtful whether hydrogen sulphide is often present in a house in sufficient quantities to produce any poisonous effects. On the other hand, in cases of typhoid fever from sewer-gas poisoning the toxic element is doubtless the bacillus of typhoid fever, for which the sewer-gas acts merely as a vehicle, and it is probable that most of the cases of sewer-gas poisoning are due to pathogenic bacteria, which happen to be present in the sewer-gas, and are carried by it into the air of the house. It is probable that in all cases of sewer-gas poisoning the toxic element belongs in one or the other of the following classes:

1st. Pathogenic bacteria, which have already been isolated and studied, and may, therefore, be said to be "known."

2d. Pathogenic bacteria, which have not yet been isolated and studied, and are, therefore, "unknown."

3d. Poisonous gases, such as hydrogen sulphide.

The first two classes are by far the most important as a cause of disease, and in them the sewer-gas merely conveys the specific germs, which have got into it more or less accidentally, and which are not necessarily present in sewer-gas.

In the case of those diseases which are known to be caused by bacteria it is not difficult to understand that the bacteria entering the drain, and finding there food, moisture, warmth, and other requisites for growth, should propagate rapidly, and subsequently getting into the air of a house through a leak in the drain, might enter the body of some person, and might cause the diseases of which they are the etiological agents. Many cases have been reported which tend to prove more or less conclusively that typhoid fever, pneumonia, diphtheria, cholera, dysentery, cerebro-spinal meningitis, ery-

[1] Rigby: Parke's Hygiene, vol. 1, p. 148.

[2] It is true that there is often an escape of sewer-gas into a house without any sickness resulting from it, but it is to be remembered that not every one exposed to a contagion, or other cause of disease, contracts the disease. In this connection the investigations of Lissauer (Vierteljsch. f. öff. Gesundht. Pflege, 1881, 13, p. 341) are of interest, who found that in six out of ten houses in which there was an escape of sewer-gas there occurred one or more cases of disease which could be attributed to the sewer-gas, while in the other four houses there was no such disease; and that such diseases occurred in only sixteen per cent. of a considerable number of houses in regard to whose sanitary condition he was gnorant, as against the sixty per cent. in the houses in which here was known to be an escape of sewer-gas.

sipelas, and scarlet fever, can be caused by sewer-gas infection.[1]

But in addition to these diseases which are caused by a well-known specific germ, there are many other forms of disease (most of which are probably also of bacterial origin) which are generally regarded as being due to sewer-gas poisoning, and which, unfortunately, are sometimes classed under that much abused term "malaria," taken in its etymological and broadest sense, "bad air." Although in a general way numerous allusions have been made to this class of diseases, both in medical and in general literature, yet when one comes to study the subject, it is surprising how little the nature of the individual diseases of this class have been studied, and how impossible it is to say just what diseases can and cannot result from sewer-gas poisoning, and what group of symptoms in any case would lead one to suspect sewer-gas poisoning. During the past few years I have seen a number of cases of this class, which I would like to present to this Association. The time allowed for the reading of papers prevents my giving more than a brief summary of each case, and indeed the cases are so few in number, and some of them are so imperfectly studied that I cannot hope to offer any well-grounded conclusions, but only to bring up points for discussion, and to suggest the importance of an exhaustive study of the subject to those members who are better able than I to investigate it. It is certainly important to know to just what disease inmates of a house in which there is an escape of sewer-gas are exposed, and this study is undertaken not with the idea of discovering the essential cause of any disease, but only to replace the general statements found in medical literature in regard to the diseases which may be caused by that very complex body, sewer-gas, by statements a little more definite, and to lay a foundation for future work on this subject. For convenience of study I have grouped the cases not according to the houses in which they occurred, but according to the symptoms which they presented.

The most generally recognized effect of sewer-gas poisoning is a disturbance in the functions of the alimentary canal, and, as illustrative cases of this group, I would report the following:

CASE I.—Mr. E., æt. fifty-five, slept in a small room, with untrapped stationary wash-stand, and for ventilation opened a window on a small well in the centre of the house, in which well an untrapped gutter-pipe connecting directly with the sewer opened not three feet from the window. On pouring oil of peppermint into a distant part of the house-drain, the odor of peppermint filled this bedroom immediately. For five or six years, almost as long as he had lived in this house, Mr. E. vomited every morning as soon as he got out of bed, and presented no other symptom. The pipes were trapped, and the plumbing put in proper order, and the vomiting of Mr. E. stopped immediately; so that, in this case, the vomiting, and the vomiting only, seemed to be directly caused by the sewer-gas. The wife of Mr. E., who slept in this same room, died of sewer-gas poisoning (Case XVI.), and his son-in-law, who did not sleep in this same room, but whose room was ventilated by the same window in the little well, also presented symptoms of sewer-gas poisoning (Case XIX.),

CASE II.—Mr. G., æt. forty-three, had been working very assiduously during two weeks in January, in a building in which the plumbing was full of defects; among other defects, sewer-gas had free access to the hot air which warmed the building. During the last week of his work in this building, and for a week afterward, Mr. G. had a severe diarrhœa, or rather purging, which came on every morning, and consisted of half a dozen or more copious watery discharges which exhausted him greatly, and then ceased, not to return till the same hour next morning. The diarrhœa finally yielded to quinia.

In these two cases the purging and vomiting occurred separately, and were not combined as they are usually, and as they were in the following cases:

CASE III.—Mr. T., æt. twenty-eight. In the spring the drain under the kitchen was broken, and the contaminated earth was upturned in order to repair the break. Mr. T. went down to look at the work, and was attacked with vomiting, purging, loss of appetite, and great prostration, which lasted about a week, and ran its course without fever. The prostration lasted about two weeks.

CASE IV.—Mr. H., æt. thirty-two. In the spring the drain under the basement was broken, and the contaminated earth was upturned in order to repair the break. Mr. H. examined the work several times, and before it was completed he was attacked by vomiting, loss of appetite, and violent purging, the stools being copious, watery, and of dark color. The purging continued about a week, and ran its course without fever. The prostration lasted about two weeks.

A Mr. P., who had charge of the repairs of this same drain, was attacked by a severe sore throat.[1]

[1] The proof that typhoid fever may be caused by sewer-gas is very strong. Numerous and convincing cases have been reported by Murchison (Continued Fevers, 2d ed., p. 472, et seq.), Hutchinson (Pepper's System of Medicine, vol. 1, p. 253), Cosgrave (Trans. Acad. Med. Ireland, 1885, 3, p. 365), Nourse (Sanitary Record, 1880, p. 127), C. F. F. (Boston Med. and Surgical Journ., 1875, 93, p. 599), and others. A striking proof that pneumonia may result from sewer-gas poisoning is given in the Medical Times and Gazette of April 4 and June 30, 1874, and cases of pneumonia apparently caused by sewer-gas have been reported by Eaton (Sanitary Record, 1885–86, p. 525), Ward (Sanitary Record, 1880–81, N. S. 2, p. 4), and Nourse (loc. cit.). Although diphtheria is more commonly propagated by contagion directly from one patient to another, yet so many cases have been reported which seem to be due to sewer-gas poisoning that this must be considered as one of its causes. Such cases have been reported by Bayley, and also by Thursfield (Sanitary Record, 1877), Tripe (Sanitary Record, June 14, 1878), Eaton (loc. cit.), Nourse (loc. cit.), Cosgrave (loc. cit.), C. F. F. (loc. cit.), Meredith (Sanitary Record, April, 1884, p. 498), and Noel (Am. Pub. Health Assoc. Reports, 1876, p. 362). That cholera may in some cases spread by means of sewers and privies appears from the epidemics described by Radcliffe (Ninth Report of the Medical Officer of the Privy Council), and Routh (Brit. Ass. Med. Journ., 1856, p. 827). Cases of dysentery due to sewer-gas have been reported by Routh (loc. cit), and Clouston (Med. Times and Gazette, June, 1865). That cerebro spinal meningitis may spread by means of sewer-gas seems probable from the report of Morris (Rep. New York City Board of Health, 1871, p. 348), and cases apparently due to sewer-gas poisoning have been reported by Ward, (loc. cit.), and Trask (Med. Record of October 16, 1875). Cases of erysipelas due to sewer-gas poisoning have been described by Nourse (loc. cit.), and others have been reported in the Sanitary Record for December, 1879, p. 221. Although scarlet fever spreads in most cases by direct contagion from patient to patient, yet that it may sometimes spread by sewer-gas seems not improbable from the cases reported by Carpenter (Sanitary Record, March 15, 1882), C. F. F. (loc. cit.), Meredith (loc. cit.), and Noel (loc. cit.).

[1] Cases somewhat similar to these first four, in which nausea, vomiting, purging, and prostration, were prominent symptoms, have been described by Foss (Medical Examiner, 1876, 1, p. 47), Noel (Amer. Pub. Health Ass. Rep., 1876, p. 362), Eaton (Sani-

Eulenberg, in his book *Die Lehre von den Giftigen Gasen*, states that the symptoms of chronic poisoning by sewer-gas are nausea, vomiting, colic, weakness, and diarrhœa, or constipation.

Workmen engaged in cleaning out sewers which have become choked are often overcome by the very foul gases occurring in such sewers, and present a very acute and severe form of sewer-gas poisoning.

Such cases have been reported by Harbordt (*Berl. klin. Wochenschr.*, 1871, p. 289), Seifert and Macintosh (*Phil. Med. Bull.*, 1883, v. p. 148), and many others. These patients are usually in a condition of collapse, comatose, and have general convulsions; if recovery takes place, there usually remains for a considerable length of time a condition of physical and mental weakness. Eulenberg (loc. cit.) divides these cases into three classes: *First*, a mild form, of which the symptoms are nausea, vomiting, colic, weight in epigastrium, pressure on vertex, dyspnœa, rapid, and small pulse, great weakness, and, in some cases, delirium. *Second*, a condition of clonic and tonic spasm, together with faintness and unconsciousness. *Third*, a severe form, in which the patients become slowly or rapidly asphyxiated. Face is pale, lips cyanotic, breathing and pulse faint. As this condition of asphyxia passes off, convulsions appear. The unconsciousness may continue three or four days, and when it passes off the patient vomits and complains of pain in his head and limbs. There is a disgusting stink emitted from the body of such patients. Dr. Herbert Barker (*Malaria and Miasmata*, 1863) has approached this subject from an experimental standpoint. He found that dogs kept in a box which was supplied with air from a cesspool vomited and purged, and would not eat. They recovered rapidly when removed from the sewer-gas. After a short exposure to the gas there was only slight exhaustion, but after a long exposure there was fever, and a condition of feebleness lasting six weeks. Dogs exposed in the same way to hydrogen sulphide fell insensible, had rapid respiration and pulse, and violent heart-action, tremors, and convulsions. Unless the percentage of hydrogen sulphide in the air was very small, the dogs died; and, in any case, they only recovered slowly from the effects of their exposure to it.

In these four cases the sewer-gas poisoning caused only a temporary gastro-intestinal disturbance which was accompanied and followed by a prostration of short duration, but in the following case the subsequent prostration continued a long time.

CASE V.—Mr. P., æt. eighteen, was present when a very foul privy vault, which had been unused and covered up for many years, was opened. He was immediately seized with faintness, and with severe vomiting and purging. Afterward he was extremely prostrated, and for five or six years he was an invalid, unfit for any physical or mental effort. He was very weak, and appeared to be in a condition of general debility without presenting any evidence of organic disease.

tary Record, 1865-66, p. 525), C. Handfield Jones (Med. Times and Gazette, July, 1871, p. 9, 2d case), Finklenburg (Viertljsch. f. gerichtl. Med., 1874, N. F., 20, p. 301), Trend (Brit. Med. Journ., November, 1878, p. 719), and Morrill (Bost. Med. and Surg. Journ., December, 1884, p. 531).

The following case is interesting in many respects.

CASE VI.—Miss S., æt. forty. An iron ventilating pipe of light weight ran up in the wall of her bedroom from the drain to the roof. The joints of this pipe were found, on examination, to be open, and the peppermint test gave a strong odor of peppermint in the room. Miss S. had occupied this room less than a year when she had an attack of acute Bright's disease, œdema of lungs, and general œdema, vomiting, diarrhœa, etc., abundance of casts, and a large amount of albumen in the urine. She was taken to the hospital, and made a good recovery. After a few months she returned to this same room, and during the next ten years had no return of the Bright's disease, but suffered from frequent attacks of complete loss of appetite, great prostration and wretchedness, vomiting, diarrhœa, coated tongue, and headache. On several of these occasions the urine was examined, and was found to be free from albumen and casts. Each attack lasted from one to three weeks, and she had eight or nine such attacks each year. A year ago she had three severe attacks of facial erysipelas; she was scarcely over one attack a fortnight before she had another, and it was these attacks of erysipelas which led to an examination of the plumbing. The defective pipe was replaced by a thicker one properly leaded, and Miss S. has enjoyed good health ever since.

In this case the escaping sewer-gas caused a succession of attacks of gastro-intestinal catarrh during ten years, at the end of which time the specific micrococcus of erysipelas probably got into this particular drain, and escaping into the room caused the succession of attacks of erysipelas, and both these kinds of attacks promptly ceased when the leak in the pipe was stopped. The question naturally arises, whether the attack of acute Bright's disease with which this series of diseases commenced, was not also the result of sewer-gas poisoning. The following cases, it seems to me, make it extremely probable that this is so.

CASES VII. and VIII.—Dr. P., æt. sixty-five. Connected with the bedroom in which he and his wife sleep, is a little room in which there is a water-closet, which they never use in the winter time and only rarely in the summer; so that the closet is rarely flushed, and it is certain that the trap often dries out. The soil pipe of the water-closet runs to an hermetically sealed cesspool. At times a bad odor is noticed about this closet. In the early part of the winter his wife was attacked by a low form of fever, which was followed by an attack of acute Bright's disease (general œdema, albumen and casts in the urine) from which she completely recovered. During his wife's illness Dr. P. began to complain of general weakness, numbness of extremities, dyspnœa, palpitation, insomnia, pain in the occiput, failing eyesight, and confusion of mind. These symptoms have continued up to the present time. Micturition is frequent. Urine is abundant and contains a small amount of albumen and many finely granular casts of small calibre. Otherwise physical examination is negative except for a high arterial tension.

The occurrence of Bright's disease almost simultaneously in the wife and husband, makes it probable that there is some local cause for the disease, and taken in connection with the case of Miss S., renders it very probable that this local cause is sewer-gas, and this probability is strengthened by the seven cases which follow.

CASES IX. and X.—Mr. K., æt. sixty-eight. Connected with his bedroom was a bath-room, the plumbing

of which was in very bad condition, allowing a free escape of sewer-gas; and under the basement floor the house-drain was broken and a large pool of sewage had gradually formed, into which a workman, who unsuspectingly walked over it, sank to his knees. Mr. K. came to the office on May 8th, complaining of great weakness, dyspnœa on exertion, and looked haggard and miserable. At that time his urine contained no albumen. He grew rapidly worse, and the next night his dyspnœa became orthopnœa, he had complete anorexia, he developed general œdema and œdema of the lungs, and his urine became scanty and contained a large quantity of albumen together with hyaline and granular casts. On May 17th he became delirious, then comatose, and died on May 20th, twelve days after he first came to the office for medical advice. His wife soon afterward began to present the same symptoms: dyspnœa, prostration, haggard face, etc. It was then suspected that the plumbing was in bad order, and an examination revealed the condition of things described above. Mrs. K. was removed to a room entirely unconnected with the plumbing, and made a rapid and complete recovery.

CASE XI.—Mrs. G., æt. fifty-six. In March she had an attack of indigestion, at which time her urine was examined and found to contain no albumen. On the following May she moved into another house, and after that time she did not feel well, and about the middle of July an attack of acute Bright's disease was ushered in by a chill, vomiting, and diarrhœa. The urine contained one-eighth per cent. of albumen and numerous hyaline and finely granular casts of small calibre. During the first few days of her sickness she had numerous chills and a low form of fever, the temperature not rising above 101°; and during the whole sickness she was extremely prostrated, so that she could not raise herself up in bed; she also had absolute anorexia and a profuse diarrhœa. An examination of the house revealed numerous leaks in the soil pipes, one hole being two inches square, through which there was a free escape of sewer-gas. The plumbing was repaired, and as soon as it was possible, Mrs. G. was removed to another house. The albumen had disappeared from the urine by the end of July, and on August 20th she was able to walk out on the street, although she did not recover her strength for several months.

CASE XII.—Mr. C., æt. sixty, as a contractor worked for a long time at a very foul sewer. Before he had finished working at it he was seized with weakness, dyspnœa, and œdema, and an examination of his urine showed one-sixth per cent. of albumen, and numerous hyaline and granular casts. He continued to present the symptoms of chronic Bright's disease, and died after a sickness of less than a year, from uræmic poisoning.

CASE XIII.—Mr. H., æt. seventy-five. About a year and a half ago he moved his office, where he worked more than ten hours a day, to a room which was heated by hot air, which was contaminated by sewer-gas, so that when the room was shut up for a few days the air became extremely offensive. At the time of moving into this office Mr. H. was an unusually vigorous man for his age. A month or two later he began to be troubled by diarrhœa and frequent micturition. To these symptoms were added dyspnœa, palpitation, sweating, frontal headache, and failing eyesight. The dyspnœa then became orthopnœa and œdema of the legs appeared. The pulse was quick, irregular, and intermittent. The heart's action was violent and irregular; the area of cardiac dulness was increased, but no murmurs could be heard. The urine contained one-eighth per cent. of albumen, and a few hyaline casts. Mr. H. is still living. He has ascites and much œdema, and a very irregular and labored action of the heart.

CASE XIV.—Mr. X., æt. fifty-five, went to work in an office in which there was a stationary washstand, the soil-pipe of which was untrapped and allowed a free escape of sewer-gas. The previous occupant of this office died, and his death certificate reads fatty degeneration of the heart, although he was said to have had Bright's disease also. Mr. X. soon after commencing work in this office began to be troubled by dyspnœa on exertion, headache, and general weakness. The dyspnœa and weakness became extreme, and about a year after commencing work in this office he was suddenly seized with a right-sided hemiplegia, followed in a few hours by coma of short duration. At that time the urine was examined and found to contain one-sixth per cent. of albumen, and hyaline and finely granular casts. The pulse was irregular and intermittent; the heart's action violent and labored; area of cardiac dulness was increased; no murmurs; arterial tension high. He left his office and travelled about and improved slowly and steadily. His urine was last examined six months ago, at which time it still contained albumen and casts. His heart's action continued labored and he was feeble. Since that time he has continued to improve in strength.

CASE XV.—Mr. S., æt. fifty. In the cellar of his store, in which he spent most of his time, there was a large opening into the drain. In the middle of the winter he began to be troubled by dyspnœa and general weakness. Pulse was rapid and feeble; heart's action extremely labored; urine contained a large amount of albumen (¾ per cent.) and hyaline and finely granular casts. He developed ascites and general œdema, and a secondary pleuritis and pericarditis, and finally died from exhaustion.

The last ten cases make it very probable that one of the effects of chronic sewer-gas poisoning is some form of nephritis. In the absence of autopsies, the nature of the renal lesion cannot be determined. In all the cases there were diarrhœa and extreme prostration. In almost all of the cases the quantity of albumen in the urine was rather small, and in the case of Mr. K. (Case IX.), when he first presented the symptoms of dyspnœa and prostration, albumen was absent from the urine and did not appear till several days later;[1] so that it seems in these cases as though the symptoms can hardly be altogether explained by the nephritis, but rather that the change in the kidneys is only one manifestation of a general infection of the body by the poison of the sewer-gas.

In the last three cases there wa a very labored action of the heart; a greater degree of cardiac disturbance even than is usually met with in Bright's disease; so that it is a question whether the poison of sewer-gas does not cause a degeneration of the heart's substance as well as of that of the kidney.[2] That this is not improbable, appears from the following case, in which, in addition to the general prostration, the heart seems to have been especially

[1] In this connection compare the first case reported by C. Handfield Jones (Medical Times and Gazette, July, 1871, p. 9).

[2] I have seen a number of cases, each one of which is too imperfect to report, but which taken collectively, lead me to believe that there is a form of disease, rather difficult of exact diagnosis, which presents the symptoms of prostration, emaciation, anæmia, anorexia, œdema, dyspnœa, and diarrhœa, and the physical signs of a weak heart, often, but not always, associated with a small amount of albumen and sometimes with casts in the urine, and occasionally with œdema of the lungs, and which is due to sewer-gas poisoning. Recovery usually takes place in these cases when the patient is removed from the sewer-gas infection.

involved, although there is no evidence of any renal lesion.

CASE XVI.—Mrs. E., æt. forty-eight. The very unsanitary condition of her bed-room (which was not discovered till just before her death) was described in reporting the case of her husband (Case I.) who for years vomited every morning. Mrs. E., who had previously been a strong, healthy woman, occupied this room for seven years, during the whole of which time she felt weak, miserable, and nervous. Her principal symptoms during these years were great weakness and nervousness, loss of appetite, dyspnœa, palpitation, and vomiting, (occasionally there was bloody vomitus at the time of menstruation, but only when menstruation was imperfect). She grew steadily weaker, so that during the last month of her life she could scarcely walk across the room, and her stomach was so irritable that she vomited almost all her food. She was anæmic and fleshy, but her flesh was soft and flabby. Pulse was small, 110. Heart's action irregular and labored. Great enlargement of the liver and of the spleen, apparently the result of passive congestion. Her urine was examined several times, and was found to contain neither albumen nor casts. Her pulse became more and more rapid; being 120 a fortnight before she died, and during the last week of her life was too rapid and irregular to be counted. Toward the end of her illness she had several attacks of precordial pain, and on the last day of her life she had two severe attacks of angina pectoris, which were relieved by hot applications and inhalations of nitrite of amyl. Soon after the last attack she became comatose and died in a few hours. No autopsy was allowed.

A common effect of sewer-gas poisoning is a condition of general weakness, and I am inclined to think that some cases of nervous prostration are due to this cause.[1] Indeed, weakness, irritability, loss of appetite, dull headache, and drowsiness are a group of symptoms which play a principal part in almost every form of disease due to sewer-gas poisoning; but there are some cases, such as the following, in which these symptoms are alone present and constitute the entire disease.[2]

CASE XVII.—Mrs. K., æt. fifty-five. The cold air box of the furnace in her house was connected indirectly with the drain. For several years she has suffered in the winter time from loss of appetite, diarrhœa, vertigo, drowsiness, and great prostration. She was tired out on slight exertion, was greatly depressed, and every duty seemed a mountain in her path. She continued to grow weaker until she could scarcely walk. Her temperature was normal. Pulse 110. The urine was free from albumen. Although scarcely able to be out of bed she was sent south and improved rapidly. In her absence the house was put in good sanitary condition, and after her return she continued to improve, and is now well.

XVIII.—Mrs. V., æt. sixty. The plumbing in her house was old, and was in very bad condition; there being a number of leaks in the soil pipes. During the winter she has frequently had attacks of chilliness. In April she began to feel very weak and miserable, had no appetite, complained of dull headache and of great drowsiness, she was much depressed and did not feel able to accomplish anything. At the same time that Mrs. V. suffered in this way her daughter became feverish and had a typical attack of typhoid fever. A servant in the house had a succession of sore throats and headaches during the whole winter. Mrs. V. went away from her house while it was being repaired and gradually regained her health and strength.

CASE XIX.—Mr. T., æt. twenty-six, lived for a short time in the house, the unsanitary condition of which was described under Case I. During the whole time that he was living in this house he felt weak and wretched, had a dull headache, no appetite, and was drowsy. He recovered very soon after leaving the house.

In all of these cases of general weakness the patients have complained of great drowsiness, and this, in my experience, is one of the first and most constant symptoms of sewer-gas poisoning. In the following case it was the only symptom.

CASE XX.—Mrs. F., æt. sixty, in consequence of anxiety and worry got into a condition of great nervous exhaustion, and was greatly troubled by insomnia. In the midst of this condition she moved into a house, the plumbing of which was found to be in a very defective condition, allowing the escape of sewer gas in all parts. As soon as this was discovered she was taken to another house, but during the five days that she remained in the house with defective plumbing, her obstinate insomnia disappeared and she slept not only during the night but also during most of the day. When she left this house, however, her insomnia returned.

Chronic sewer-gas poisoning often manifests itself in an irregular low form of fever either with or without chills, as is seen in the following cases.[1]

CASE XXI.—Mr. M., æt. sixty-seven, had locomotor ataxia for several years and had been pretty closely confined to his sitting-room and bed-room, both of which were on the same floor, and between them with doors always wide open, was an old-fashioned pan closet, which was found by the peppermint test to leak badly, and on examination the cement was found to have fallen away from the joint of the soil pipe leaving a large opening. Mr. M. was suddenly seized with a severe chill followed by fever and by a delirious semi-comatose state. During the next week he had frequent chills followed by high fever and sweating. He was frequently comatose during and after the chills, and was much of the time delirious. The chills occurred once or twice a day at no regular hour, usually in the morning, and occasionally in the afternoon also. The leak in the water closet was then discovered. It was found impossible to remove him effectually from the sewer-gas infection, but he was moved into a hall bed-room and the water closet door was kept shut, with the result, that he had one slight chill on the day that he was moved but no more, and the temperature fell to 99½° the next day and was afterward normal. He continued to have absolute anorexia, grew steadily weaker and finally died from exhaustion.

CASE XXII.—Dr. H., æt. thirty-one. On February 7th he did not feel well and had no appetite, and in the evening his temperature was 102°. He did not feel well during the next week, but his temperature continued normal till the evening of February 13th, when it was again 102°. He then began to be troubled by a severe dry cough, his appetite continued poor, but his

[1] Compare Morrill (Boston Med. and Surg. Journ., Dec. 1884, p. 531).

[2] Compare Eaton (Sanitary Record, 1885–6, p. 525) and Cosgrave (Trans. Acad. Med. Ireland, 1885, p. 365, Case 101).

[1] Compare Burrall (N. Y. Hosp. Gazette, 1879, p. 662), Nourse (Sanitary Record, October, 1880, p. 127), Trask (N. Y. Medical Record, October 16, 1875), and Noel (Am. Health Ass. Reports, 1876, p. 362).

temperature continued normal till the evening of February 19th (another interval of just six days), when it was 103°. After that time the temperature continued elevated; being a little above normal in the morning and rising to 102° or 103° in the evening. On February 21st he discovered a very bad break in the drain beneath the kitchen floor; the ceiling of the kitchen was broken and above it was his bedroom with a poor floor, thus allowing the foul air an easy access to his bedroom. The break in the drain was repaired as soon as possible. On the 24th, 25th, and 26th he had slight epistaxis, bowels were rather constipated, the dry troublesome cough continued. On February 27th the temperature was A.M. 99°, P.M. 104°. On the 28th A.M. 101°, P.M. 100¾°. On March 1st, A.M. 99½°, P.M. 99½°. After this the temperature remained normal, his appetite slowly returned, and he gradually recovered the flesh which he had lost.

Such cases of fever have been frequently reported. The epistaxis and the dry troublesome cough recall typhoid fever.

CASE XXIII.—Mr. P., æt. thirty-four. In an alcove off from his bedroom is a stationary washstand, in which there was a leak, and consequent escape of sewer-gas. He was attacked by pain in his head and back, loss of appetite, and great prostration. He had a low form of fever for two weeks, the temperature being 101° every night with great regularity, and between 99½° and 100° each morning. After two weeks of this low form of fever, the temperature commenced to rise, and the spleen commenced to enlarge, although it was not so before. At the same time diarrhœa commenced, and there were tenderness and gurgling in the right iliac fossa; a couple of days later he had an epistaxis, and about a week later rose spots appeared. In other words, after a low form of fever continuing for two weeks, an attack of typhoid fever commenced with all the typical symptoms, which then appeared for the first time. The typhoid fever ran a perfectly regular course, and lasted three weeks. In this case, then, the sewer-gas poisoning produced a low form of fever, during the course of which the system became infected with the typhoid fever germ, probably also from the sewer-gas.

Under Cases IV. and XVIII. sore throats have been mentioned as occurring in houses at the same time with other forms of disease due to sewer-gas poisoning, and cases of sore throat have often been reported as being due to sewer-gas poisoning.[1] In many of these cases the sore throat has a diphtheritic character, as in the following case:

CASE XXIV.—Mrs. C., æt. sixty, lives in a house in which, within two months, there have been a case of pneumonia, a case of erysipelas, and a case of measles in the adult. Beneath the basement floor there is a bad break in the drain. One evening the stench from this drain was very offensive, and Mrs. C., who was sitting in the basement, was seized with a chill, headache, and sore throat. That night she was feverish, and the next morning there was a compact, oval patch of white membrane on each tonsil, measuring about a half by a quarter of an inch in its long and short diameters respectively. In thirty-six hours these patches fell off, leaving quite deep ulcers, which slowly healed. There was no enlargement of the cervical glands. The throat wat sore, and deglutition was painful. Pulse varied from 80 to 90. Temperature was 100½° in the morning and 102° in the evening. On the fourth day of the disease the fever left her, and she felt in every way so much better that, although still very weak, she considered the disease as over, as indeed it was, although she continued greatly prostrated for several weeks.

Such cases as these may be considered either as mild forms of diphtheria, which they probably are, or they may be considered as necrotic tonsillitis, following the classification in *Strümpell's Text-book of Medicine*.

Not infrequently sewer-gas poisoning shows itself in disease of the nervous system. The most common of these diseases thus produced is neuralgia, as can be seen from the following cases[1]:

CASE XXV.—Mrs. L., æt. thirty, slept in a middle room opening out of a bath-room. An examination of the plumbing showed that it was very old, and leaked in almost all parts, the bath-room being particularly defective. During five or six weeks she suffered from intense neuralgic pains, which commenced in the lumbar region and extended around into the groin and down the posterior and other outer surfaces of the thighs and legs. These pains recurred daily, and were so intense as not only to require morphia hypodermatically, but they reduced the patient to a very low and precarious condition. She was also extremely weak, and had no appetite. When the trouble with the drain was discovered, she was moved to another house. After she was taken to the other house there was no return of the pain, her appetite returned, and she quickly regained her strength. There could hardly be a more striking example of neuralgia due to sewer-gas poisoning than this one.

CASE XXVI.—Mrs. T., æt. thirty-two, lives in a house in which the plumbing was found to be in an extremely defective condition. In the latter part of December she had an attack of fever, lasting three days, the evening temperature being 103.8° on one night and 103° on another. Even after the fever left her she continued to be weak, and to have no appetite. On the first of January she was attacked with severe neuralgia of the ninth right intercostal nerve, which continued till the third week of January, when she went out of town. Early in February she returned to her house, and on the second day the pain returned, and was accompanied by a slight attack of jaundice. She then moved into another house, and in a couple of days her neuralgia ceased, and in a week the jaundice disappeared also.[2]

There is another form of nervous disease which I am inclined to think may also be caused by sewer-gas, and that is myelitis of the anterior horns, which is probably an infectious disease.

CASE XXVII.—Mr. B., æt. twenty-nine, worked in a little wooden shed built on the very edge of the Albany Basin, and just over the outlet of one of the principal city sewers. The stench at times was so bad that the clerks had to relieve each other frequently, and go up the street for a little fresh air. He worked in this place, from May till October, for three summers. During the third summer he noticed that he was very drowsy during the day, although somewhat restless at night, and that his appetite was very bad. On the first of September,

[1] Compare Carden (Brit. Med. Journ., March, 1884, p. 600), Davis (Sanitary Record, March, 1885, p. 401), Brown (Brit. Med. Journ., March, 1879, p. 346), Morrill (Boston Med. and Surg. Journ., December, 1884, p. 531), and Nourse (Sanitary Record, October, 1880, p. 127).

[1] Compare Morrill (Boston Med. and Surg. Journ., December, 1884, p. 531).

[2] Jaundice has been noticed in cases of sewer-gas poisoning, by C. Handfield Jones (Med. Times and Gazette, July, 1879, p. 9) and by Burrall (N. Y. Hosp. Gazette, 1879, 7, p. 662).

1880, at 5 P.M., his legs suddenly gave way under him, and he fell. He managed to walk home, and to creep upstairs on his hands and knees. The next day he could move his arms and legs a little, but inside of three days he lost completely all power of voluntary movement, except that he could masticate his food pretty well; for a short time he was unable to close his eyes. There was no disturbance of sensibility, but a complete loss of all the reflexes: superficial, deep, and organic. He went through a typical attack of myelitis of the anterior horns, with great muscular atrophy, and the electrical reaction of degeneration. At the end of a year he could get about on crutches, and in about two years and a half he could walk without a cane. Even at the present time, seven years after his attack, he is emaciated and weak.

CASE XXVIII.—Mr. B., æt. forty-two, was obliged to inspect for several weeks a sewer which was being repaired, and which emitted a very bad stench. In the course of this inspection he was attacked by a chill followed by fever, and during three weeks he had a low continued fever, with frequent chills. After the fever ceased he did not regain his health, but during the next year steadily lost flesh and strength, his appetite became poor, he had neuralgic pains in various parts of the body, and his health failed in every way. His urine was free from albumen and casts. At the end of a year his legs suddenly gave way under him, and he fell several times in the street. He then developed a well-marked case of myelitis of the anterior horns, from which, after several years, he made a complete recovery, and is now in good health.

Finally, I will report a case in which the diagnosis as to the nature of the disease is doubtful, but which seems to be an undoubted case of sewer-gas poisoning.

CASE XXIX.—J. L., æt. six and a half, slept in a middle bedroom, with connecting bath-room, in a house in which there was a free escape of sewer-gas, especially in this bath-room. The sanitary condition of the house was described under the case of his mother (Case XXV.), who presented a well-marked case of severe neuralgia, due to sewer-gas poisoning. His grandmother, who had lived in the same house, suffered from great prostration and an obstinate bronchitis,[1] both of which quickly disappeared when she moved to another house. I saw the boy in consultation once only. He had, for a week or more, such a severe frontal headache, probably of a neuralgic character, as to suggest the possibility of cerebral disease; but no other cerebral symptoms could then be discovered. His tongue was coated, pulse was rapid, there was decided enlargement of the spleen, and his urine contained albumen. During the first two weeks of his sickness he had a fever ranging from 99° in the morning to between 100° and 101° in the evening. He became extremely emaciated. About a week before his death there was, during several days, a partial suppression of urine. Cheyne-Stokes respiration appeared, he gradually sank, and, without any expression of pain on his face, he died, a little less than three weeks after the commencement of his sickness. No autopsy was allowed.

In all of these twenty-nine cases there was an escape of a large amount of sewer-gas into the air which the patient breathed, and at the time that each case was observed it seemed extremely probable that the sewer-gas was the cause of the disease. I have notes of a number of other cases of this class, but as they are not in all respects convincing, I have not reported them; and I would only say that it seems to me that phthisis, and also diabetes mellitus, may sometimes have their origin in sewer-gas poisoning.[1]

From a consideration of these twenty-nine cases, we may conclude that it is probable that the following conditions may result from sewer-gas poisoning:

1st. Vomiting and purging, either separately or combined.

2d. A form of nephritis.

3d. General debility, in some cases of which the heart is especially involved.

4th. Fever, which is frequently accompanied by chills.

5th. Sore throat, which is frequently of a diphtheritic character.

6th. Neuralgia.

7th. Perhaps, also, myelitis of the anterior horns.

These conditions may occur separately, but are frequently combined, and it is especially common for the fever to be associated with the other forms of sewer-gas poisoning.

Finally, in cases of sewer-gas poisoning there is one group of symptoms which is almost always prominent, and these symptoms are: loss of appetite, drowsiness, extreme prostration, and a dull, unpleasant feeling in the head; and whenever this group of symptoms occurs, not as the result of an attack of acute disease, but as a chronic condition, we are justified in suspecting that the patient is exposed to sewer-gas infection.

If we summarize the cases of sewer-gas poisoning which are scattered through medical literature, and which have been mentioned in the notes to this paper, we find that more or less satisfactory evidence has been adduced that the following diseases may result from sewer-gas poisoning:

8th. Zymotic diseases, such as: typhoid fever, pneumonia, diphtheria, cholera, dysentery, cerebro-spinal meningitis, erysipelas, and scarlet fever (in these cases undoubtedly the sewer-gas merely acts as a vehicle for the specific germ).

9th. A condition of asphyxia, which, in its severe form, is characterized by coma, convulsions, and collapse.

10th. Puerperal fever.

11th. Abscesses.

12th. Lymphadenitis.

13th. Acute aural catarrh (?).

[1] In regard to bronchitis due to sewer-gas poisoning, compare Nourse (Sanitary Record, October, 1880, p. 127), and Ward (Sanitary Record, 1880–81, N. S., 2, p. 411).

[1] In addition to the numerous reported cases of disease due to sewer-gas poisoning mentioned in the notes to this paper, there are some other forms of disease which it is claimed are due to sewer-gas poisoning. Thus, Playfair (Lancet, February, 1887, p. 251), Cosgrave (Trans. Acad. Med. Ireland, 1885, 3, p. 365), Brown (Brit. Med. Journ., March, 1879, p. 346), and Trask (N. Y. Med. Record, October 16, 1875), think that puerperal fever may be due to this cause; while Brown (loc. cit.), Owen (Lancet, 1878, 2, p. 172), Cheadle (Lancet, August 17, 1878), and Noel (Am. Pub. Health Ass. Rep., 1876, p. 362), think that abscesses and enlarged and suppurating lymphatic glands may be due to sewer-gas poisoning; and Cassells (Edinburgh Med. Journ., 1878, 18, p. 910) thinks that acute aural catarrh may be due to the same cause.

SOME CLINICAL OBSERVATIONS ON THE EFFECTS OF THE LATEST FEBRIFUGE, ACETPHENETIDINE.

BY THOMAS J. MAYS, M.D.,
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THE latest febrifuge has been brought to the notice of the profession in the *Centralblatt für die medicinische Wissenschaften* of February 26, 1887, by Messrs. O. Hinsberg and A. Kast, under the name of acetphenetidine.

According to the *Pharmaceutical Record* (May 1, 1887), they obtained it from carbolic acid by the process of nitriting, separation of the arthro- and para-nitrophenols, acetylating the latter, reducing the π nitrophenol to π amedophenol, which is called phenetidin, and acetylating the phenetidin with glacial acetic acid, making the final product, acetphenetidine. It crystallizes in colorless needles, is slightly soluble in water, but dissolves in alcohol, and in glacial acetic acid. It is tasteless, and melts at 135° Celsius.

Their experiments on dogs with this agent showed that it was only in very large doses—from 45 to 75 grains—that it produced toxic symptoms. These consisted in accelerated respiration, somnolency, giddiness, vomiting, and cyanosis; and after having fully convinced themselves of its harmlessness in doses of from 15 to 30 grains per day, they essayed to test its action on fever in the human body. They gave it in the pyrexia of phthisis pulmonalis, in doses of from 45 grains to 2 drachms, three times a day, and found that it gradually lowered the temperature without producing any untoward effects whatever. Its action is said not to be accompanied by any sudden dissipation of heat, or by any profuse hydrosis.

Shortly after the announcement of these results appeared, I had the pleasure of receiving a small amount of the drug through the kindness of Mr. Merck, with which I made a few observations in its relation to the fever temperature of pulmonary phthisis. The agent yielded some good results, but on account of the limited amount at my command, the test extended only over a few days, a period too short to arrive at any definite conclusion concerning the utility of the drug. The first was an acute case of phthisis, with an afternoon temperature of 105⅕° Fahrenheit, which was preceded by a chill. I gave her three grains of acetphenetidine every three hours. She had another chill the next day, and her afternoon temperature was 104°. The third day her temperature had sunk to 101° P.M., and she had no chill that day. The fourth day she had another chill, but her temperature only rose to 101⅕° P.M. The fifth day her temperature was down to 98°. Discontinued the acetphenetidine. On the sixth day she had no chill, but her temperature rose to 101° P.M. On the seventh day she had a chill, and her temperature rose to 103⅖° P.M. Began the acetphenetidine again. Ninth day, temperature 100⅘° P.M. Tenth day, 100⅘° P.M. At this point the supply became exhausted, but from even this limited experience with the drug it was quite obvious that it had a marked influence in depressing the temperature. Besides this, her cough, appetite, and general condition seemed to mend.

The other was an old cavity case, with a temperature of 102° Fahrenheit P.M. He was given the same dose. Temperature, second day, 101⅖°. Third and fourth days, same. Fifth day, 100° P.M. This patient's expectoration and cough also seemed to improve while he was taking the medicine.

It is slower in its action than antipyrine or antifebrine, but probably on the whole safer. In order to obtain its best effects I think it should be given in a large dose at the outset, and then followed up with further doses in accordance with the demand of the supervening symptoms. It is worthy of investigation, and I shall give it a further trial in the near future.

THE PROGNOSIS OF CERTAIN HEART MURMURS,

WITH SPECIAL REFERENCE TO THE SELECTION OF RISKS FOR LIFE INSURANCE.[1]

BY FRANK DONALDSON, JR., B.A., M.D.,
OF BALTIMORE, MD.

THE great importance of the prognosis in any given case of cardiac disease is, I venture to assert, not sufficiently emphasized by the average practitioner. There has always been a strong tendency to overestimate the importance of heart murmurs in themselves (heart disease in general), and to take too grave and sombre a view of them, without considering their position, or the symptoms associated or not associated with them. Of late years, however, especially among those skilled in auscultation, there has been a decided change of opinion, and the hopelessness which was once attached to the presence of organic disease of the heart no longer obtains. The discovery of a murmur is not now regarded as an infallible indication of unavoidable and early death. We now recognize the numerous forms of disease to which this organ is subject; we discriminate one affection from another, and we distinguish between what are conditions of passing debility and anæmia, and those graver ones of dilatation, valvulitis, and fatty degeneration.

Indeed, it may not be too broad a statement, that since the introduction of that most wonderful heart drug, *strophanthus*, even these severer forms of disease have much less terror for the physician, and that with this agent for good in our possession, the chances of a favorable prognosis are a hundredfold increased.

Again, this shifting of opinion as to the fatality of cardiac murmurs is beginning to work an important change in the selection of risks for life insurance in this country, as it has already done in England, where valvular disease, as such, is no longer a cause for total rejection, and where increasing attention is given to the signs of dilatation and displacement of the heart and to deficiency in the general circulation; the really risky cases are excluded,

[1] Address delivered before the State Medical Society of West Virginia, July 14, 1887.

and the persons selected for insurance who seem to have as good a prospect of prolonged life as those who are passed as "good" or "fair" risks—in other words, the risks are graded—such cases being insured at a higher premium.

As an examiner for a number of large companies I have given the subject considerable attention, *and it has been my practice for at least two years, in cases where there was a systolic basic murmur (aortic or pulmonary), or a slight mitral murmur, with no history of rheumatism, gout, or syphilis, and with no secondary symptoms, to postpone the risk.* I have, as I say, followed this rule in a number of cases, and have had the satisfaction of seeing the murmur disappear and the person get his insurance, of which it would have been so unjust to deprive him and his family. I am fully aware that the position I am taking will be criticised by the more conservative medical directors and examiners; but this is a question which undoubtedly needs to be brought forcibly before the medical profession, and especially before examiners of life companies. The majority of medical examiners, I am inclined to believe, rarely *locate* the murmur in any given case, and more rarely consider its significance—whether there may not be good grounds for postponement of the risk. Only the other day, in talking to a medical examiner of many years' standing, and an exceptional diagnostician, he said, "Well, really, this is something I never considered in all these years; if I heard a murmur in any situation I turned the risk down, and that ended it." I could not but tell him he had in that case done many people grave injustice.

This by way of introduction. I desire first to give brief consideration to the latest views as to the prognosis of certain organic murmurs, and, secondly, to the significance of the so-called functional murmurs, their situation and causation.

I. PROGNOSIS OF ORGANIC MURMURS.

The elements of prognosis in heart disease are complex, but not necessarily complicated. To prognosticate the course and issue of any given case we must find—

1. The valve affected, and the relative danger attaching to the particular lesion.

2. The actual condition of the orifice and valve, and the degree of obstruction or amount of regurgitation to which the lesion has given rise.

3. The nature and tendency of the morbid change in the valve, whether stationary or progressive.

4. The condition of the muscular tissue of the heart, and how far compensatory changes may be counted on.

5. The mode of life of the patient.[1]

The relative frequency of the different forms of valvular disease of the heart is mitral regurgitation, aortic constriction; aortic regurgitation, mitral constriction; tricuspid regurgitation, pulmonary constriction; pulmonary regurgitation, tricuspid constriction.

In this paper I shall not consider diseases of the right heart. In order of relative danger diseases of the left heart may be placed in the following order: Mitral stenosis, aortic regurgitation; mitral regurgitation, aortic stenosis; though the latter is the most fatal when it is developed late in life, when it is progressive in character, and when compensatory hypertrophy is with difficulty established.

The actual condition of the orifice or valve is next to be ascertained, in which our chief guide is the murmur; but it must be remembered that a loud murmur may be produced by very slight change, while a scarcely audible murmur may be indicative of extensive destruction. A loud murmur is, on the whole, of less serious import than one which is weak and soft. The former is indicative of the force of the heart, at least. A long murmur, except in cases of mitral or aortic stenosis, is usually indicative of early and comparatively slight disease and of efficient action of the heart. A short murmur, on the other hand, says Broadbent, is sometimes significant of impending danger. The roughness or smoothness of a murmur *may be* of diagnostic significance. An accent at the beginning of a murmur shows that the valves still act as a check to the influx of blood. A post-systolic or diastolic murmur means that the valves come together accurately at first, but not afterward.

The pulse may be a source of considerable information. In aortic obstruction it is long, and the initial wave slight. In aortic regurgitation we find, of course, the typical "Corrigan's pulse." In mitral stenosis the pulse is small, but regular; in mitral regurgitation (when considerable) the pulse is small and very irregular.[1]

Hypertrophy and dilatation are too often looked upon as caused by the valvular disease *alone*, and as a measure of its extent. While this is to a great extent true, no direct ratio constantly holds between the amount of hypertrophy and of valvular obstruction, which would seem to show that there is something beyond the mechanical which contributes its quota of causation.

The connection between the valvular disease and hypertrophy or dilatation is dependent upon several considerations:

1. Different affections of the valves have greater or less tendency to the production of structural alterations.

2. The time of life at which the lesion takes place is of great importance.

A valvular lesion established in youth, for instance, will probably, by reason of the great hypertrophy give little trouble for many years at least.

After middle age, on the other hand, it would prove fatal before hypertrophy could be accomplished.

Again, the mode of life of the person will greatly influence the development of hypertrophy. Moreover, valvular disease accompanied by structural change in the heart is of more serious import than when not accompanied by it. For instance, in aortic constriction there must either be increase in

[1] Broadbent.

[1] Probably due to the increase of blood pressure in the auricle. See Foster's Journal of Physiology, vol. iii., 1882: "The effect of variations of intracardiac pressure upon the vagus nerve." H. Sewall and F. Donaldson, Jr.

the propulsive power of the heart or *diminished arterial pressure*. Increased power, however, can be gained only by hypertrophy, and a direct aortic murmur accompanied by hypertrophy is of more serious import than one not accompanied by it.

In aortic insufficiency a certain amount of blood returns to the ventricle at each systole. To compensate for this the capacity of the ventricle must be enlarged; which is exactly what happens in this lesion. Dilatation, then, in such a case is totally distinct from that following structural weakness of the heart walls. For in the former case hypertrophy takes place and prolongs life; in the latter, no such saving process is brought about.

Another important factor influencing prognosis in heart disease is the *stationary* or *progressive* character of the lesion. For instance, congenital malformation of the valves would be stationary, and valvular lesions from acute endocarditis are also for the most part stationary, except when the inflammatory process has caused a mitral stenosis. Disease from chronic endocarditis and degenerative changes in later life, and due to gout and renal disease, is, on the other hand, progressive.

Again, dilatation of the orifice may derange the functional efficiency of a valve which itself has undergone no alteration. This is common with the mitral valve, and may occur at any time of life, induced by acute disease or by debilitating influences such as anæmia, chlorosis, etc.

The distinction, says Dr. Broadbent, which it is usually most important to make is between the lesions originating in acute endocarditis, which are probably secondary, and the lesions produced by chronic inflammatory or degenerative changes, which are inevitably progressive.

So much for the prognostic significance furnished by the heart itself. The other chief conditions which influence the future of a case of heart disease are:

Age. Valvular disease appears to be more serious in early childhood than a few years later; the weakened heart cannot keep pace with the active growth at this age.

Sex. It is somewhat remarkable that mitral stenosis is more common in women than men. In 53 cases seen by Broadbent, 38 were females, 15 males. Personally, I have never seen a case in man. Aortic insufficiency, however, is more frequent in man. Girls with valvular disease are more likely to break down at puberty than boys.

The mode of life of the patient, and the tension of the arteries, have a considerable bearing upon prognosis in any given case.

Such being the prognostic indications in heart disease generally, let us consider the prognosis in—

1. *Aortic Stenosis*. The supposed frequency of aortic stenosis is chiefly due to the fact that all those cases in which a systolic aortic murmur is heard are classed as cases of true stenosis, when in reality in only a small proportion of such cases does this condition actually exist. The various conditions under which an aortic systolic murmur may exist will be considered later. In a given case, however, where we have an obstruction to the flow of the blood we find considerable hypertrophy; and if this be due to the narrowed valves, the aortic second sound will be indistinct. If, however, the sound is accentuated, the hypertrophy is due to renal disease, and tends to a less favorable prognosis. The pulse in true aortic stenosis will be long and slow, and the artery will be small and full between beats.

Aortic stenosis proves fatal by the slow operation of dropsy, mitral regurgitation following as a result of dilatation. But the danger is not imminent so long as the aortic obstruction is uncomplicated by mitral trouble. Dropsy having once set in in a case of aortic stenosis, there is less probability of recovery than in most other valvular affections. Finally, most authors agree in placing aortic stenosis as the least dangerous of valvular troubles.

II. Aortic Regurgitation.

The diagnosis of this affection offers no difficulty. The elements of prognosis, when the symptoms have not become prominent, and compensation is fairly effectual, are briefly as follows: If with the diastolic murmur the second sound be distinctly audible in the neck, the dilatation and hypertrophy are inconsiderable, and the pulse exhibits the collapsing character only in a moderate degree. If the valvular lesion be the effect of acute endocarditis, and therefore probably stationary, the prognosis is favorable. If, on the other hand, the second sound is completely abolished, with hypertrophy, dilatation, and a collapsing pulse, the prognosis is grave, and the comfort and life of the patient depend greatly upon his family constitution, age, habits, occupation, and circumstances. It should be remembered that the heart's nutrition is not well maintained after middle age, and that there is a tendency to increased peripheral resistance with increasing age.

Coming on late in life, aortic regurgitation is always serious. The disease is progressive, and finally ends either from a failure of the ventricle in systole (in which case we have the attacks of angina, paroxysmal dyspnœa, weak and very irregular pulse, etc., but no dropsy), or death ensues from venous obstruction, and the symptoms do not differ materially from those of mitral insufficiency. Sudden death may be expected, and is the rule in aortic insufficiency.

III. Mitral Insufficiency.

Mitral insufficiency is not a deadly kind of valvular affection, and is probably less serious than aortic stenosis, which is placed lowest in the scale of danger. A circumscribed mitral murmur, not heard in the back, is of lttle import; but care must be taken not to take the soft murmur of a gaping orifice and a weak heart as an indication of slight mischief.

The first indication of marked insufficiency is the accentuation of the pulmonary second sound, followed by hypertrophy and dilatation of the right ventricle from increased pulmonary pressure, with displacement of the apex of the heart, and hypertrophy of the left ventricle, with consequent increased cardiac impulse. At this stage the symptoms may become very serious and alarming, but proper treatment and care may establish the equilibrium

and the patient continue in fairly good health for years.

Moreover, a very important element in mitral insufficiency is the hypertrophy of the right ventricle and the consequent increase in its force, by which it causes increase of pressure in the left auricle, which resists the back flow of blood, while the pressure in the left auricle must be greater than the pressure in the arterial system. Much depends upon the extent of this peripheral resistance; the less the arterial tension the more favorable the prognosis. And it is just in this we may find, I think, the reason why in so many cases digitalis fails to do any good, the patient becoming steadily worse under its administration. Digitalis, while increasing the power of the heart, also increases very considerably arterial tension, which is the very thing in certain cases we wish to avoid. As long as compensation is established our prognosis is very favorable, but it grows, of course, less so if there are signs of dilatation, vascular derangement, etc.

So much for the prognosis, speaking generally, in these various cases of heart disease. How should the knowledge thus obtained affect our present way of dealing with risks for life insurance?

There is no questioning the fact that valvular disease may exist for many years without producing any secondary or disagreeable symptoms. Dr. Symes Thompson says that "it might cause surprise to some to learn that during ten years about 1000 cases came under the notice of a single physician in which chronic valvular disease existed, the presence of which was not indicated by symptoms, and did not sensibly interfere with the health."

Again, of 684 persons tabulated (by Sir Andrew Clarke), 326 sought medical advice, not for heart disease, but for disorders of digestion; 134 for disorders of the nervous system; 61 for rheumatic affections; 47 for respiratory disorders; 30 for skin diseases, and 33 for gout. In none of these cases was the presence of valvular disease indicated by symptoms, nor was the heart to any extent affected.

Dr. Thompson gives the following data from his own experience in two large life insurance companies, where risks with heart murmurs are "rated up":

"Taking the experience of one of my own offices (the Equity and Law Life), I find from the last analysis of invalid lives that of 5 cases rated up for disease of the mitral valve the average age of the insurers was 35 years, the average addition 23 years, and no deaths occurred during the period comprised in the report; whilst out of 15 cases in which the nature of the heart disease is not specified the age was 41, average addition 8 years, and 3 deaths occurred. From the subsequent course of these cases it appears that of the first series, those with mitral disease, two have since died, one after having been insured for 13 years, to whose actual age 7 years had been added. Had 12 been added, no loss would have occurred to the office. In the other fatal case, which also occurred from heart disease, 10 years had been added to the actual age, but the policyholder died at the end of five years, and an addition of 20 years would have been needed to save the office from serious loss.

"In two other cases of the mitral series the results have been good; the cases were rated up to 20 and 25 years respectively, and are now living, having been insured, the one for 22 and the other for 12 years. Taking this series alone, the gains fairly balance the losses.

"In the other class, that in which no definite valvular disease was mentioned, 6 deaths have occurred, one by accident one year after the policy was taken out, and two others at short periods, viz. 6 years and 9 years. In two they lived 27 and 18 years respectively.

"Of the 7 cases now living, all have lived long enough to cover loss, and 3 have proved very advantageous. Thus, this class, like the first, has not been found by experience unsatisfactory, although in many of the cases the extra rating had not been nearly sufficient; and, curiously enough, this is specially true with the lives that have proved unfortunate.

"The general results of the experience of these cases have been confirmatory of the received opinion that where definite heart disease exists, a really considerable addition is demanded."

In view of these facts, the injunction of the various American companies that "heart disease shall be cause for absolute rejection," seems to me to be too absolute and too general, while I recognize fully the importance of a wise caution in the selection of lives for insurance, it seems to me that too great caution has hitherto been observed. After all, in examinations for life insurance, justice should be done the applicant as well as the company. But the question naturally presents itself: How shall we in such cases distinguish the favorable from the unfavorable risk?

The first important point to be determined is whether there is any evidence of degenerative change, obstruction of the circulation, or liability to rheumatism or gout. The mechanical and vital power of the heart is more important than the murmur, and, within certain limits, than the seat and nature of the valve lesion. The only two forms of such disease which I consider as "ratable" are mitral insufficiency and slight aortic stenosis. Speaking generally, aortic defect is most to be dreaded; mitral lesions, on the other hand, being the most hopeful.

Again, a heart that has been damaged by rheumatic fever during the period of growth is more likely to be adjusted to the extra work thrown upon it than when the disease occurred in adult life. Often all evidence of disease disappears in a few years, and the heart beats in the normal position, showing that no serious hypertrophy has occurred.

The most marked and easily recognized lesions are not those to be most dreaded; there is more importance to be attached to signs of weakness or enlargement of the heart, to a change from its normal position, to signs of degeneration in its walls or those of the bloodvessels, and to the conditions of life, than to the murmur merely; and a patient whose life is happy, active, pleasant, and prosperous, will be more likely to live out his expectancy than one who, with a smaller amount of actual lesion, has an harassed, anxious, life of toil, confinement, and trouble. Sir A. Clarke himself lays down five propositions with regard to disease of the mitral valves: First. That there shall be no degeneration of the heart. Secondly. That the disease shall have existed two years. Third. That the ventricles shall be in good order. Fourth. That the arteries shall be sound. Fifth. That there is no persistent basic

nor recurrent hepatic congestion; that colds shall not hang about the patient, and that his general health shall be good; given all these and, says Sir Andrew, "the mitral disease will not shorten life." Dr. Bristowe says: "When I find a mitral systolic murmur extending over many years, that the second sound is not accentuated, and that the apex (of the heart) is in its place, I think I am justified in admitting them" (for insurance).

Dr. Clifford Allbutt made a very practical suggestion on this point. It was that such cases should be put upon the early-payment system, so that all premiums should be paid up before the age of thirty-five.

Finally, Dr. Borland says:

"The whole summary of the matter seems to be that the selection and admission of these cases is one of great delicacy, and requires the highest qualifications of experience and ripe, sound judgment on the part of the physician; that though in the hands of a few men of exceptional experience a few (very few) cases of aortic valvular disease may be admitted at a greatly advanced premium rate, yet that as a general rule for the majority of examiners the safe course will be rejection. But as to mitral disease of some standing, dating from early life, and occurring in otherwise healthy, temperate persons, subject to no laborious exertion or great anxieties, and having no enlargement or displacement of the organ, and no fatty or other degeneration of heart or arteries, an addition varying with circumstances from ten to twenty-five years should be made to the actual age."

FUNCTIONAL MURMURS, THEIR SITE, CAUSATION, AND PROGNOSTIC IMPORTANCE. HOW SHOULD THEY AFFECT THE SELECTION OF RISKS FOR LIFE INSURANCE?

The heart murmurs known as functional have been the subject of much discussion and difference of opinion. It has been customary, however, to include under this term all those cases in which the murmur depends upon temporary and curable conditions, or in which no distinct alteration of the valvular segments can be detected after death. Functional murmurs are invariably systolic in time, and are heard, as the case may be, over the true pulmonary area, close to the left of the sternum between the second and third ribs; 2d, over a space of about an inch and a half to the left of the sternum, and in the second interspace just where the left auricle comes up from behind to the left of the pulmonary artery; 3d, over the aorta. The murmurs in these three situations are usually found in some form of chlorosis or anæmia, or in the course of acute febrile disease, and may be dependent upon a changed condition of the blood, constriction or dilatation of the artery, or acute dilatation of the heart.

Pulmonary systolic murmurs are more frequent than any other form of cardiac murmurs. Dr. Guitéras, of Charleston, states that in 100 consecutive cases he found 62 systolic pulmonary murmurs.

The clearness of the murmur depends upon the proximity of the artery, the thinness of the chest walls, and the proximity of the main trunk to the capillary circulation. It seems to be generally acknowledged that a systolic pulmonary murmur may be *developed in healthy individuals* by modifying the act of breathing; and this is a point which is of special interest and importance with reference to life insurance. These murmurs are confined in ordinary breathing to the expiratory act, being loudest at the beginning. They frequently disappear when the chest is elevated in inspiration. Sometimes a very slight, shallow inspiration causes the murmur to disappear. Again, it does not disappear even upon the deepest inspiration. Another interesting and important peculiarity of this murmur is that it is very frequently inaudible when the individual is in the erect position, but at once appears when the recumbent posture is assumed. Again, the murmur is sometimes only heard with the first beat that occurs with expiration. Finally, the fact that a loud systolic murmur in the pulmonary region may be found in a perfectly normal heart cannot be too forcibly emphasized. The causation of these inorganic pulmonary murmurs has been a source of much discussion.

It has been generally asserted that the sudden propulsion of a large amount of spanæmic blood into a dilated vessel would be sufficient cause for their production. Again, Dr. Russell holds that the murmur is caused by a constriction of the pulmonary artery by a dilated left auricle, while Quincke, of Berlin, thinks that the artery is compressed by the heart during its systole, following an uncovering of the base of the heart by a retraction of the lung, which, I take it, is the opinion of Balfour.

Dr. Guitéras would explain a murmur in the pulmonary area as a "dynamic obstructive murmur produced by the effect of changes of blood pressure upon the semilunar valve. A certain degree of pressure in the artery must tend to prevent the opening of the valve; this would or might cause a slanting position of the valve and a narrowing of the orifice, with the production of a sonorous whirl"—an explanation, I think, which has much to support it, for an accentuated second sound always accompanies a pulmonary murmur—sure evidence of increased pressure in the pulmonary artery. Dr. Guitéras goes on to say that, "the fact that such murmurs are not more frequently developed at the aortic orifice is due to the greater power of the left ventricle and the wider distribution of the systemic circulation."

Pulmonary murmurs then, as we have seen, are found under very varying conditions, and are *compatible with perfect health.* Are we then justified in rejecting a person for life insurance in whom after careful examination, we diagnosticate such a functional murmur? I say emphatically, No. Only two weeks ago I examined one of the most thoroughly healthy men I have seen for a long time—a man of fine physique, good habits, excellent family history, an active and prosperous business man. His pulse was 76, full and strong, but on listening to his heart I discovered a distinct murmur over the pulmonary artery. I was, much to my own chagrin and his annoyance, compelled by the company to turn the risk down. Surely great injustice was done, and I hold that such cases are perfectly legitimate risks for a life insurance company to take.

AORTIC SYSTOLIC MURMURS.

Functional murmurs at the aortic orifice are found in anæmia, and in the course of acute febrile diseases such as typhoid and rheumatic fevers, and also in those persons who are under great strain, who are overworked, anxious, and excited. There are many causes which may produce an aortic systolic murmur. If in an examination for life insurance such a murmur is found, the important point to be ascertained is whether the murmur indicates the existence of actual obstruction. If there be marked anæmia, other things being equal, we should, of course, conclude that the murmur was hæmic. It should be remembered that a systolic aortic murmur appearing at middle age or in advanced life will seldom be due to actual narrowing of the orifice, but is probably due to roughness and irregularity of the valves or slight dilatation of the aorta. The loudness or general character of the murmur does not give us much help. Hæmic aortic murmurs are usually soft and smooth, but so also may be murmurs due to extreme narrowing, especially when there is weakness of the ventricle. Thus a gradual enfeeblement and disappearance of a systolic aortic murmur may be a most serious prognostic fact. It is plain, then, that there are many things to be considered and careful attention required before we can say whether a systolic aortic murmur is surely functional. But such a conclusion having been arrived at, it is only just to the person who is an applicant for life insurance to postpone the risk in order to see if the murmur may disappear. I have made it a rule for some time past to postpone such risks, and have no reason to regret such action. We have been too sweeping in the past in condemning such cases, and so depriving men who are in reality perfectly healthy, of the protection of life insurance.

Much might also be said on that condition known as curable mitral regurgitation, but my paper has already exceeded all reasonable limits, and I shall have accomplished my purpose if perchance I have shown that a murmur by itself is nothing; that they have little if any pathological significance, unless other changes are associated with them; if I shall have impressed the fact that great care is necessary for a proper prognosis, in justice to our patients and ourselves; and, finally, if I shall have forced upon the notice of medical examiners how necessary it is to decide exactly the significance of any given murmur before rejecting the person applying for the insurance.

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SYPHILITIC CIRRHOSIS OF THE LIVER IN A CHILD.

By J. OLIVER JENKINS, M.D.,
of Newport, Ky.

The occurrence of syphilitic cirrhosis of the liver in a young child is but seldom met with in general practice, and the report of a case may not be without interest.

Katie, aged twelve years, when first seen was bright and intelligent. Her parents gave a satisfactory history of entire freedom from specific disease. Thorough inquiry failed to elicit the slightest evidence of any hereditary or other disorder. The mother aborted at about the fifth month of her first, second, and fifth pregnancies, but from causes satisfactorily explained. The father and mother enjoy good health. The children of the family are healthy and robust, presenting no symptoms of scrofula, syphilis, or other disease; their teeth are even, regular, well shaped, and firm.

Katie, the second oldest of the children, we are informed, was a fat, rosy baby, and was never troubled with any sickness until about the third year, at which time she and an older brother were vaccinated by a barber. Two attempts resulted in failure; the third produced a small pustule at the point of puncture on the arm, and was speedily followed by the development of an intractable ulcer on the posterior surface of the right knee. Her brother had a similar ulcer on the sternum.

So-called smallpox occurred in both the children three or four months afterward, but did not present certain characteristics of the disease. The eruption was confined chiefly to the face and thoracic regions, was pustular in form, and distributed unevenly over the surfaces, and very few crusts were formed. There were no cicatrices or pits left, except where the initial ulcers, previously spoken of, had been located. Both children were but slightly ill, and promptly recovered. The boy has remained well, except during an attack of typhoid fever in 1883; the girl, however, was afflicted with various sicknesses for a period of four years after the vaccination. In the order named came: first, at three years, smallpox; fourth year, scarlatina; fifth year, diphtheria; sixth year, pneumonia of right lung followed by dropsy. The diphtheria was of great severity, and was complicated with "sore eyes" and greatly enlarged submaxillary glands, the latter suppurating and requiring the use of the knife. Her recovery was very protracted.

When about seven years of age her parents noticed that her gastric and hepatic regions were becoming prominent, but paid little heed to the circumstance. The distention becoming greater from year to year, medical advice was sought, and she came under notice in May, 1885, when twelve years of age, and was seen occasionally from then until March, 1887. Her abdomen was found to be greatly enlarged in all directions; the umbilicus depressed; the superficial veins not prominent; her body fairly well nourished; the skin clear; no jaundice or œdema. Palpation showed the liver to be enlarged in both lobes; also the spleen. Dulness exceeded normal limits two inches downward in the hepatic, and a fraction over three inches in the splenic regions; sulci could be determined between the right and left lobes of the liver, and between the left lobe and the spleen. A tympanitic space was found at the cardiac orifice of the stomach and in the lower abdomen. The prominence of the latter was due to the crowding downward of the intestines by the mass above. Her appetite and digestion were good; there was absence of pain; slept well; temperature normal; lungs and heart normal.

Measurements made at this date and the two succeeding years were as follows:

	Inches.		
	1885.	1886.	1887.
Circumference of body at lower end of xiphoid cartilage	25	26	28
Midway between above point and umbilicus	27	27½	28¾
At umbilicus	27	27	28¾
From end of xiphoid cartilage to genital fissure	14	15	16½

These measurements indicate the rate of enlargement to have been about one inch annually.

Notwithstanding the great pressure which was exerted upon other organs, the absence of distressing symptoms

continued until a few hours previous to death. This very immunity to complications made a diagnosis impossible. The urine was frequently examined, and was always found to be normal.

In seeking a diagnosis the presence of a deep-seated echinococcus cyst was taken into consideration, because her diet had consisted largely of raw scraped beef during her several illnesses. A small quantity of albuminous fluid was secured from the most prominent part of the liver, and microscopically examined by Dr. E. B. Bayliss, but gave only negative results. Shortly afterward a diagnosis of hepatic cancer was made at the clinic of one of the medical colleges in Cincinnati.

The treatment during the entire time from 1885 until her death, in 1887, consisted of systemic tonics, preparations of mercury, arsenic, and potassium iodide, alternated as was deemed advisable. Later events proved this to be the appropriate treatment, although probably not begun at a date sufficiently early to eradicate the diseased nodules found after death.

The last forty-eight hours of life were marked by hemorrhages from both stomach and bowels. The left side of the neck and face became swollen and œdematous, and left hemicrania appeared, otherwise there was no discomfort. One hemorrhage greater than the preceding ones suddenly terminated life.

Autopsy, twenty hours after death, by Dr. James M. French, of Cincinnati. Rigor mortis moderate. Slight ecchymotic discoloration of posterior surface of the body. Eyelids œdematous, especially the left, the swelling involving the whole of that side of the face. Brain not examined. Heart and lungs normal.

The liver appeared as a mass of round or rounded nodules of a yellow color, varying in size from a hen's egg to a pea, and even smaller. The organ was with difficulty dissected from its abnormally firm attachments and removed. It was considerably enlarged, weighing five pounds, irregularly nodulated throughout, and much firmer than usual; in no way, in fact, resembling a healthy liver. Section revealed numerous firm, irregularly distributed fibrous bands, and a large number of rather firm, not hard, masses, varying in size between a hulled walnut and a split pea. These masses were found in greatest number in the region of the transverse fissure. The surfaces of these on section was not altogether smooth, but emitted no juice, and none could be obtained by scraping.

The gall-bladder was partially filled with bile and mucus. The spleen was about twice its normal size, but not much firmer than usual. The right kidney was normal in size and appearance, but on incision two small collections of pus were found. The left was much increased in size; capsule slightly adherent; interstitial tissue hyperæmic; and the pelvis contained about one drachm of pus. The stomach and intestines contained dark fluid and tarry blood. A few slightly enlarged mesenteric glands were observed, but no general adenopathy.

Sections of the liver for microscopical examination were made mostly in such a manner as to include a portion of the harder nodules referred to above, and some of the surrounding tissues. These nodules were found to be composed almost entirely of very delicately fibrillated connective tissue, exceedingly rich in nuclei, the fibres of which had been divided in the section both longitudinally and transversely. Some embryonic cells were also present. The appearance was that of old gummatous formations. The tissue surrounding these masses was made up of the parenchymatous elements of the liver, for the most part in a state of fatty degeneration, and a large amount of fibrous tissue. The bands of this tissue were more than double in amount those which normally separate the hepatic lobules, and, in addition to being very irregularly distributed, contained exceedingly numerous embryonic cells. These fibrous bands were largest in the portions of the organ corresponding to the great depressions of its surface.

That other causes than alcoholism will operate to produce a cirrhotic condition of the liver is becoming more and more manifest. Syphilis as a cause of the disease has been acknowledged since the description of it given by Gubler, in 1852. French, in the *Reference Handbook of the Medical Sciences*, vol. iv., p. 543, states: "In a certain small proportion of cases the disease is independent of alcoholic indulgence. Acquired syphilis may produce a hyperplasia of the interstitial tissues of the liver which is usually very irregularly disseminated throughout the organ." As gummata were found numerously scattered throughout the liver, and were proved by the microscope to be syphilitic in character, the conclusion that the cirrhosis was dependent upon acquired syphilis must be accepted.

As to the method of infection, the supposed vaccination is the only acceptable source. Bumstead, Taylor, and others point out the dangers and accidents which may result from the careless use of an infected scarifier of whatever kind. Also, that the blood of a syphilitic, introduced into a wound on a non-infected person, will produce the original disease. In the present case it is not improbable that the barber, in vaccinating the children, used an implement common to his trade, a razor, which had been improperly cleansed after use; or he may have used crust virus, in which there was a portion of unhealthy blood. From whichever cause happening, the thought of danger should be a warning to the physician to have his instruments scrupulously cleansed after each and every vaccination, and, if possible, not to use humanized virus in the operation.

MEDICAL PROGRESS.

THE CREASOTE TREATMENT OF TUBERCULOSIS.—SOMMERBRODT is quoted by the *Medical Chronicle* for July, 1887, as follows:

The author gives the results of his treatment of about 5000 cases of tuberculosis of the lungs and larynx, continued throughout nine years. For two years—1878 to 1880—he used Bouchard's solution of creasote. Since 1880 he also used gelatine capsules, containing each ¼ of a grain of creasote and 3 minims of balsam of tolu, commencing with one capsule the first day, and gradually increasing to six capsules a day in the fourth week, and after two months nine per diem; as many as from 600 to 2000 capsules being thus taken by each patient without a break. He did not neglect other means, such as "lung gymnastics" and ventilation, and other favorable conditions, but still continued the creasote treatment throughout. The result in many cases was a very favorable influence upon the disease—a marked diminution in the cough, even at the commencement of the treatment, lessening of expectoration, improvement of the appetite; even night sweats and fever ceased without the use of quinine, agaricin, etc. The physical signs were often greatly improved, even to the disappearance of dulness on percussion. He believes that he has thus *cured* cases of tuberculosis by insisting upon a continuance of the treatment. Tubercle of the larynx,

though a hindrance, is not a bar to its use. It is at least a testimony to its value that after nine years' experience the author steadily pursues this treatment. The following case is given: "On November 17, 1886, a gymnasium student, aged sixteen, came under my notice with considerable tubercular infiltration of the right lung. He had taken the usual dose of one capsule of creasote three times a day, but on December 28th he came again and reported very considerable improvement in every respect. Through a misunderstanding it appeared that he had taken three capsules at a time, three times a day—about half a gramme per diem. His excellent state of health induced me to make no alteration, and on January 16, 1887, he had used in this way 627 capsules, in 73 days 7¾ drachms of creasote. He hardly coughed at all, had increased 6 pounds in body weight, there was no dulness at the right apex, only slight rhonchus, expectoration had quite ceased, the urine was normal, and his general health had so much improved that he went back to school."

A CONVENIENT APPLICATION FOR RHINITIS, WITH OZÆNA.—PENNY, in an article in the *British Medico-Chirurgical Journal*, No. 16, 1887, gives the following as having done good service in his hands:

Iodoform	gr. x.
Ol. eucalyptol.	ʒj.
Pulv. acid. boracic.	ʒj.
Ol. sassafras ethereal	♏x.
Vaseline	ad. ℥j.

EXCISION OF THE KNEE-JOINT BY LONGITUDINAL INCISION.—DR. SENN thus describes this operation as performed by Riedinger, of Heidelberg:

The patient was a boy about six years of age, suffering from tuberculosis of the knee-joint. Evidently the disease was in its earlier stages, as the joint was only moderately swollen and did not present that sense of semi-fluctuation as is the case in advanced fungous inflammation of this joint, at the same time the articular surfaces were not displaced. The operation was performed as follows: The whole limb was thoroughly washed with warm water and soap and subsequently with a 1:1000 solution of sublimate. Esmarch's constrictor was applied about the upper third of the thigh, and a *longitudinal* incision made over the centres of the patella, dividing the tissues with one stroke down to the bone, and passing through the lower portion of the quadriceps and the tendon of the patella. At a corresponding point the patella was sawn through in the same direction, so that the divided patella and the soft parts presented two symmetrical halves, which when separated exposed the joint fully to inspection, both by sight and touch. Without much difficulty the lateral halves were so widely separated that the lower end of the femur was brought fully into the wound and the articular end was removed with a saw, the line of section being below the epiphyseal cartilage. The tibial end was treated in the same manner. At least two osseous foci were exposed by the bone sections, and each was carefully scraped out with a sharp Volkmann's spoon. This long anterior incision fully exposes the upper recesses of the synovial sac, and renders the extirpation of the entire capsule an easy matter. After the extirpation of the capsule with curved scissors the whole surface was irrigated with a sublimate solution and carefully dried, and the parts restored to their normal relationship, and the two halves of the patella tacked together by applying two catgut sutures passed through the tendinous covering and periosteum, but not through the bone.

The only provision for drainage was a rubber drain introduced into the upper angle of the wound. As the limb is kept in a nearly perpendicular position for at least twenty-four hours, the drain occupies the most dependent position of the wound, and answers all requirements. The remainder of the wound is closed with silk sutures. A copious gauze dressing, embracing nearly the entire limb, is applied, over which a thick layer of absorbent cotton and equable compression by bandaging limb from toes to groin. A posterior hollow splint, with footboard, serves to immobilize the limb. The constrictor is not removed until the whole dressing is applied. The first dressing is not changed for a week, when the drain is usually found outside of the wound. As the wound at this time is usually firmly united, the sutures are removed and the limb put in a plaster-of-Paris splint. Anatomically this operation presents a number of advantages. I have always observed after making the transverse incision, that on account of muscular traction of the extensors of the leg, there is not only a tendency for separation of the fragments of the patella, but a constant traction always results in the formation of a wide and often ugly cicatrix, in the skin; conditions which are avoided by the anterior longitudinal incision. When the articular ends of the bones are brought fully into such a wound by forcibly flexing the leg upon the thigh, the entire synovial sac is brought into full view and rendered accessible to removal with scissors. The tissues divided in the direction of the axis of the limb, serve a most useful purpose in securing immobilization during the process of repair.—*Journal of the American Medical Association*, July 16, 1887.

A FORMULA FOR ERGOT, HYPODERMATICALLY.—HILDEBRANDT recommends the following:

Aqueous extract of ergot . . .	3 parts.
Glycerine,	
Distilled water, each	7 parts.

From five to twenty drops may be injected beneath the integument of the thigh or abdomen to check uterine hemorrhage.—*Journal de Médecine*, July 3, 1887.

A NEW TEST FOR MILK.—A new test for water—that is, pump water—in milk has recently been proposed by Herr Szilasi. This depends on the fact that sulphate of diphenylamine is colored blue by the action of an exceedingly dilute solution of a nitrate. As well water always contains more or less nitrate, its presence in milk can be detected. The test is carried out thus: Twenty minims of sulphate of diphenylamine is placed in a small porcelain vessel and a few drops of the milk which is to be examined added to it. If this contains even five per cent. of average well water, a blue tinge will gradually distinctly appear. Sulphate of diphenylamine is easily procurable, and only costs about sixpence an ounce, so the test may be readily tried.—*Lancet*, June 11, 1887.

THE PROPER METHOD OF EXAMINING THE BREAST.—DR. GROSS says that, to examine properly a woman's breast, she should be lying on her back. If examined in any other position, it can be so manipulated as to convert it into any tumor. When on her back, examine by pressing the tips of fingers back through the breast against the chest walls, and not by pinching the structures up between the fingers—*College and Clinical Record*, July 1, 1887.

THE TREATMENT OF ACUTE CORYZA.—FRITSCHE, of Berlin, has found the following useful;

℞.—Acid. acetic. glacial,
Acid. carbolic. . . . . āa gr. 30
Mixt. oleoso-balsam. . . ʒ 2
Tr. moschi . . . . . ♏ 15.—M.

Fifty drops of this may be put upon cotton and enclosed in a convenient flask. Inhalations, at first every half hour, and later at longer intervals for ten minutes, will be found beneficial.—*Berliner klinische Wochenschrift*, July 4, 1887.

THIERSCH'S METHOD OF SKIN-GRAFTING.—DR. MYNTER reports this method, as proposed by Thiersch, of Leipzig, and as he has used it in the Buffalo (N. Y.) General Hospital, as follows:

The granulations are removed by the aid of a sharp spoon down to the underlying firmer tissues, and the rather copious bleeding stopped by pressure with compresses dipped in a solution of chloride of sodium, 0.6 per cent. The bleeding stops generally in the course of five to ten minutes. The flaps are now cut with a sharp razor, generally from the outer surface of the humerus, and then transferred directly on the shining surface of the wound, deprived of its granulations. The flaps are five to ten centimetres long, one to two centimetres broad, and contain, even if microscopically thin, the whole papillary layer and a part of the underlying stroma.

The flaps are completely unravelled by aid of two probes, and then firmly pressed against the surface by aid of a soft sponge dipped in the same solution of chloride of sodium. The transplanted wound is covered with a piece of protective dipped in the salt solution and an antiseptic bandage applied over it, which is not disturbed for eight days; the superficial wounds produced by the razor healing in eight days under iodoform bandages. If the wound be completely covered with flaps it will be healed in about eight days; but in very large ulcerations, especially after severe burns, it is almost impossible to get skin enough from the patient himself, and one will then after eight days have the opportunity of seeing not only the growth of the flaps themselves, but also the stimulating effect on the border of the wound, which is quite wonderful to observe. It is astonishing to see how quickly the cicatrization progresses in those large ulcerations from the border and the numerous islands formed by the new flaps.—*Buffalo Medical Press*, July, 1887.

THE TREATMENT OF NERVOUS DYSPEPSIA.—IHRING, of Offenbach, is quoted as follows by the *Journal of Dietetics*, No. 2:

We should first recommend a milk diet—lukewarm milk with or without crushed rusk. Unfortunately, through the habit of using highly seasoned dishes from youth up, we often find an aversion to milk. To cover its taste with sweet is not to the purpose, but we have at times added a small quantity of malt extract. The addition of cognac to the milk, as is used with phthisical patients, is equally imprudent. The best thing to give it an agreeable taste is a little table salt. Among other things we may add a little cocoa, deprived of oil, but with little sweetening, and some interruption, as in many cases an aversion for cocoa sets in. Tea is in some cases tolerated when cocoa causes loathing, but coffee has a dyspeptic effect. Tea has a tendency, especially if strong, to produce nervous palpitation of the heart, and, if left too long on the leaves, dyspepsia. If none of these beverages can be taken, we may at first use soup for breakfast. Amylaceous substances here especially find their place, and in the preparation of such among these as barley, oats, rice, etc., the precaution to have them long and thoroughly boiled should be given. For a second breakfast, some bouillon free from fat, with an egg; at noon, a plate of soup, with a corresponding portion of extract of meat. The last meal of the day ought to be taken at least two hours before going to bed, and should consist of beef-tea, with eggs and stale white bread. Milk may at any time be taken in place of one of these meals; so may eggs beaten with a little salt and water.

According to physiological experiments on digestion, boiled albumen appears to be more easily and rapidly digested, but in reality raw albumen is more easily peptonized than the solidly cooked lumps of albumen, because the movements of the stomach separate it with facility, and it is soon saturated with gastric juice.

If the appetite gradually returns, and the articles of food named are tolerated in larger quantities, we may intercalate another meal; the soup may also be prepared from scraped beef and the latter eaten with it. Gradually a saucerful of the articles already mentioned may be taken every two or three hours. This amount will be sufficient for a long time.

If, under this regimen, gastric digestion takes a normal and rapid course, the sense of hunger may be felt oftener than every two or three hours, but the patient should not yield to his cravings. The time will then soon arrive when more consistent food can be taken, especially properly cooked meat. The opinion that so-called white meat is especially well borne, has not always been confirmed in practice. It may perhaps be the case with pigeon and chicken, etc., but veal is certainly barely tolerated, owing, probably, to the large amount of gelatine it contains. As a rule, boiled meat is better tolerated than roast; and cold roast better than warm, and this is particularly true of game. With the latter, fat gravy, and the fat of pork especially, plays a very injurious part. Meat not too strongly salted is well borne, but the smoking process will spoil this advantage. The flesh of geese and ducks is difficult to digest.

Most patients will dislike to dispense with vegetables, but the very lightest of those only should be allowed until after improvement has made some progress; we may then allow carrots, spinach, and tomatoes; lettuce and salads, and especially potato salad, should be strictly forbidden. If the patient chafes under the pro-

hibition of all kinds of preserves, he may, when convalescent, partake of stewed cranberries, strained and sweetened. Dyspeptics cannot bear raw fruit at all.

In all cases where circumstances will not permit the diet which has been described, a milk diet will be the best thing. Or when place and time are favorable, Krukenberg's direction, "When you are hungry, eat buttermilk; and when you are thirsty, drink buttermilk," should be observed. This milk, freed from the large mass of caseine, is a real panacea, and a dietary course of it is easily carried out in the country during the summer season. But caution prescribes that it should not be taken simultaneously with other food, as the rule not to drink when you eat, and not to eat when you drink, is even more imperative for dyspeptics than for persons suffering from adiposity. Patients are most difficult to manage in regard to their diet after they begin to feel better; and when, in consequence of their long fasting and their necessarily reduced condition, a strong desire for food is manifested, an adequate addition of fat of the proper consistency will greatly lessen the danger of excess, as will be mentioned hereafter.

Of the greatest importance in cases of tympanites is the local application of water, preferably the "Neptune belt," since it acts as a desiccative upon the skin. If the sensibility of the skin is impaired in a high degree, we may, instead of cold water, dip the cloth in a solution of salt. The "Neptune belt," is best applied over night, like the Priessnitz bandage, and can be followed in the morning, first by moist and afterward by dry friction.

Sitz baths of from ten to fifteen minutes' duration, twice a day, are of excellent service, in case the rectal sphincters are contracted, or hot and sensitive. Water may be used at about 50° to 55° C., and in the course of time the temperature can be further reduced, as patients get easily used to it. After a sitz bath the spasmodic contraction of the anus wlll rapidly cease, and the swelling of the mucous membrane subside. The piles empty themselves and shrink, flatulency disappears, eczema in this region will heal without further treatment, so will fissures, and operative treatment for spasmodic strictures becomes superfluous. There is still a prejudice against the use of sitz baths for abscesses around the anus, for the reason that tuberculous foci are often found there, with consecutive rectal fistulæ, and it has been supposed that sitz baths cause congestion of the lungs. We take no share in this view, and would merely raise the temperature in cases where the rectal walls are lax. When lukewarm full baths are not deemed necessary, cold, moist, and afterward dry frictions should take their place.

THYMOL IN CHOLERA INFANTUM.—UNGAR uses the following with good results:

Thymol	gr. 2¼.
Spts. vini gallici	3ʒ¼.
Aquæ destill.	℥2½.

Of which teaspoonful doses are to be used as the physician's judgment dictates.—*Revue Générale de Clinique et de Thérapeutique*, June 30, 1887.

DOES CURETTING THE INTERIOR OF THE UTERUS DESTROY THE POSSIBILITY OF CONCEPTION?—HEINRICIUS, of Helsingfors, Finland, reports 60 cases of fungous endometritis treated by curetting the endometrium: 25 of these cases followed parturition or abortion. Among these 25 patients 15 became pregnant after recovering from the treatment, of whom 5 were less than thirty years old, 8 less than forty, and 2 more than forty. In the 10 cases remaining there was no report from 1; 1 was a widow; 1 was thirty-nine years old, and 7 were over forty. Of the 35 cases whose endometritis was not caused by pregnancy, there was no report of 6, and 1 died; of the remaining 28 only 1 conceived after treatment. In all, of 52 patients on whom curetting was done, 16, or thirty per cent., afterward conceived. Pregnancy occurred twice in the fifth, once in the eighth, and once in the fourth week after recovery among these patients.—*Centralblatt für Gynäkologie*, July 2, 1887.

EXPERIMENTAL INSERTION OF THE URETERS IN THE RECTUM.—At the annual meeting of the Italian Surgical Society, held at Genoa in April, 1887, PROFESSOR NOVARO, of Siena, read a very interesting communication on an experimental operation performed in January on a dog, for the insertion of both ureters in the rectum. The operation was successful, and the dog is now living and doing well. This operation was partially, and without good success, attempted by Gluck and Zeller, of Berlin. Bardenhauer, of Cologne, succeeded with only one of the ureters. Professor Novaro thought that in cancerous tumors of the bladder the complete extirpation of the bladder ought to be performed in two operations, reserving the explorative for the last. Scooping such a fragile organ only resulted in harm; moreover, only arrested the hemorrhage for a few days. The members applauded Professor Novaro for his successful result.—*Chicago Journal and Examiner*, May, 1887.

BIRTH DURING MATERNAL SYNCOPE.—FREYER, of Berlin, in a work of medico-legal value, has made exhaustive studies of the literature of the subject, from which he draws the following conclusions:

1. The possibility of birth during maternal syncope is undoubted, and proved by many observations.

2. It is probable that this happens during concealed parturition much more frequently than under ordinary circumstances.

PHOSPHATE OF SODIUM HYPODERMATICALLY IN PHTHISIS.—BARATOUX claims good results from the following:

℞.—Sodii phosphat.	1 part.
Sodii sulphat.	1 part.
Aquæ destill.	15 parts.—M.

S.—Filter before using. Injections of from forty-five to ninety minims may be made once or twice weekly, in the sacro-lumbar region. These injections are followed by fever, cerebral excitation, and a feeling of fatigue for one or two days. A feeling of general improvement follows, the appetite returns, perspiration lessens, and expectoration loses its purulence. Gain in weight has been observed.—*Revue de Thérapeutique*, July 1, 1887.

THE DANGERS OF ANTIFEBRIN AND ANTIPYRIN.—Two articles have recently appeared in the Hungarian medical journal *Gyógyászat*, in which the profession is

warned that acetanilide, or antifebrin as it is called, though it is not without value, is an uncertain, and indeed a dangerous antipyretic. DR. GÉZA DULÁCKSKA finds, after giving the drug a prolonged trial in the hospital, that small doses may bring down fever, but that in some cases even three-grain doses produce violent sweats, prostration, and hemorrhage or cyanosis. It does not appear to him to exert any favorable action on the course of the disease itself, being thus inferior to salicin, resorcin, and ichthyol. If given at all in fever, its action requires to be very carefully watched. In certain neuroses, however, Dr. Dulácksha has found it very useful, and as the doses required were smaller, he is disposed to recommend its employment in such cases, as it appears to be free from danger. In a case of severe trigeminal neuralgia, in which quinine, gelsemium, and morphia had produced but little improvement, three grains of acetanilide were given night and morning without effect; seven grains and a half were then ordered, divided into ten powders, one to be taken every two hours. This produced a great improvement, and after ten days of this treatment the cure was complete. No unpleasant effects beyond some nocturnal perspiration showed themselves. Two other cases, where severe pain was associated with meningo-myelitis and syphilitic tabes respectively, which had been treated in various ways unsuccessfully, were greatly benefited by acetanilide, no unpleasant effects being produced. DR. BIRO gave acetanilide in eighteen cases of various kinds, including typhoid, croupous pneumonia, pleurisy, polyarthritis, tuberculosis, and phthisis, in doses varying from a grain and a half to forty-five grains per diem, and was much struck with the uncertainty of its action, an effect being sometimes produced by a grain and a half, while at others ten or eleven grains had no effect at all. Most of the patients complained of chilliness, while cyanosis and irregularity of pulse occurred in several cases. In one case, where seven grains and a half had been taken, there was a severe rigor followed by cyanosis, sweating, and an irregular, thready pulse, the symptoms being so alarming that recourse was had to brandy and hypodermatic injections of ether. In another case, in which acetanilide had been given for eleven days, similar symptoms presented themselves, together with clonic spasm of the lower extremities, reminding one of the symptoms in anilin poisoning. Altogether, Dr. Biro thinks that the evil effects of acetanilide are so great that it cannot be recommended for general adoption.

Two Scandinavian physicians have recently written on the use of antipyrin, the apyretic properties of which they unreservedly admit to be the rule. Some exceptions, however, were observed. Thus DR. WETTERDAL, of Upsala, found in one case a rise of temperature during the first hour after a thirty grain dose of more than 1° F. Rigor and collapse never occurred in any of his cases. Copious sweating, however, was observed at times, over which atropine exerted no control. A rash with bluish-red spots on the face, as described by Wising, was also occasionally noticed. In some cases cinchona was advantageously combined with antipyrin. Dr. Laache, who made a special study of the action of antipyrin in phthisis, found that, though as a rule it brought down the hectic very satisfactorily, in one instance it produced, at first at least, a contrary effect, the temperature rising very markedly after a thirty grain dose. It afterward fell gradually, reaching a point decidedly below the normal. Simultaneously with the rise a rash appeared, and the patient complained of a burning sensation in the mouth and eyes and along the œsophagus. Curiously enough, the patient had previously taken antipyrin for a longer period without having experienced any unpleasant effects. The sample could not well have contained any poisonous admixture, as other patients took it with impunity.—*Lancet*, July 9, 1887.

A CONVENIENT APPLICATION FOR INSECT BITES.—BERNBECK uses the following:

Flexible collodion . . .	19 parts.
Salicylic acid	1 part.

Or,

Flexible collodion . . .	1000 parts.
Bichloride of mercury . . .	1 part.

—*Wiener Presse*, July 10, 1887.

THE PERCENTAGE OF SUCCESSFUL SECONDARY NERVE SUTURES.—MR. BOWLBY, of St. Bartholomew's Hospital, in a series of articles on injuries of nerves, reports the following results of suture in the *Lancet* of July 16, 1887:

The value of the operation of secondary suture can only be judged by a clinical study of patients, and by reference to recorded instances. Time does not permit me to describe in detail the clinical features of the various cases I have watched, or to do more than tabulate the records of other surgeons. For the present, therefore, I must ask you to accept this summary.

The following cases of secondary suture were performed in St. Bartholomew's Hospital up to December, 1885:

Median nerve: successful, 1; partially successful, 4; failure, 1—total, 6. Ulnar nerve: successful, 2; partially successful, 5; failure, 3—total, 10. Musculo-spiral nerve: successful, 1. Median and ulnar nerves: partially successful, 1. Grand total, 18—viz.: successful, 4; partially successful, 10; failures, 4.

Cases of secondary nerve suture recorded in surgical literature up to December, 1885:

Fifth cervical nerve: successful, 1. Median nerve: successful, 3; partially successful, 5; failure, 3—total, 11. Ulnar nerve: successful, 5; partially successful, 1; failure, 3—total 9. Musculo-spiral nerve: successful, 11; greatly improved, 3; failure, 2—total 16. Radial nerve: successful, 1. Median and ulnar simultaneously: successful, 1; partially successful, 2; failure, 3—total, 6. Median and radial simultaneously: partially successful, 1. Sciatic nerve: successful, 1; improved, 1; failure, 1—total, 3. Popliteal nerve: improved, 1. The above cases give a grand total of 49, of which 23 were successful, 14 partially successful, and 12 failures.

If the cases recorded by myself be added to those recorded by other authors, the totals will read thus: successful, 27; partially successful, 24; failures, 16—total, 67.

In drawing up the above summary I have been very careful not to include amongst the "successful cases" any but those in which there appeared to be either a complete or almost complete restoration of function.

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SATURDAY, AUGUST 20, 1887.

THE DIAGNOSIS OF CANCER OF THE STOMACH.

THE symptoms of cancer of the stomach are often so obscure, so misleading, and sometimes so entirely latent as to baffle the most experienced diagnostician, and the same remark may apply, with lesser force, to the physical signs of the disease. The cases most easy of diagnosis are certainly those in which a well-marked tumor may be felt in the epigastrium, a tumor, however, that may be confounded with neoplasms of liver, pancreas, intestine, and lymphatic glands, with biliary calculi, and simple inflammatory thickening of the anterior wall of the stomach.

Of the latent forms of the disease, those in which neither tumor nor decided gastric disturbance is present, a diagnosis, until within a recent period, could only be made by the most careful exclusion. At present, however, thanks to the labors of several German and French observers, we are in possession of certain facts which, taken singly, are of material aid in the diagnosis of gastric cancer, and, when coexistent, are pathognomonic of that affection.

In diagnosis of cancer of the stomach the greatest significance is to be attached to the absence of free hydrochloric acid from the contents of the viscus. In testing for this acid, certain precautions, emphasized by RIEGEL, in the *Zeitsch. für klin. Medicin*, Bd. xii., are necessary. In the first place, the stomach contents should not be examined within three hours after eating. Secondly, vomited matters are not suitable for examination, because emesis generally takes place within the proscribed period, and the chemical reactions are disturbed by large quantities of bile and mucus.

The technique of this test is both mechanical and chemical. The gastric contents are first withdrawn by the stomach-pump, or siphon, and the secretions may be stimulated by the introduction of a small amount (100 cubic centimetres) of ice-water, followed in ten minutes by a smaller quantity (3 cubic centimetres) of water of a much lower temperature. The whole is withdrawn, and submitted to the following tests: First, the presence or absence of free hydrochloric acid is determined; secondly, the digestive power of the liquid is ascertained.

As tests for the hydrochloric acid, the following substances are employed: Methyl-violet, lacmus, tropæolin, congo-red, gentian-violet, etc. In all his examinations, Riegel employs several tests, and, with regard to methyl-violet, he declares that, in the examination of several thousand specimens of gastric juice, he did not encounter one that digested well and gave no reaction with this substance; and, on the other hand, the specimens that gave the reaction always digested well. This important test is thus applied: Into each of two test-tubes are poured 50 c.c. of distilled water, followed by 2 drops of a 2 per cent. solution of methyl-violet. Into one of the tubes is now added, drop by drop, the fluid obtained from the stomach; to the other is added an equal quantity of pure water. If free hydrochloric acid be present in the gastric contents, the fluid in the first tube will turn blue, while, in the latter, it will retain its violet hue. According to RENAULT (*Revue Générale de Clinique et de Thérapeutique*, 16 Juin, 1887), methyl-violet may be replaced by gentian-violet, which gives the same reaction.

While there can be no doubt that the absence of hydrochloric acid from the stomach contents is a most important point in the diagnosis of gastric cancer, the general acceptance of the fact has been retarded by the unwarranted claims that have been made regarding it. For example, Von den Velden has formulated the law: "When hydrochloric acid is absent from the liquid withdrawn from the stomach, such absence is due to a cancerous neoplasm." This statement is refuted by the observations of Riegel.

In the course of the last year Riegel studied 16 cases of cancer of the stomach, in 5 of which the diagnosis was confirmed by an autopsy. In these 5 cases he made 154 analyses of the contents of the stomach with a digestive test and quantitative estimation of the amount of acid present. In none of these numerous analyses was free hydrochloric acid found, and in no instance did the filtrate of the stomach contents possess the power of digesting albumen. In one of the cases, hydrochloric acid, in large dose, was given soon after meals, but here, also, at the time of examination, free acid could not be found, and the gastric juice was without digestive power. In this case, on the days of the administra-

tion of hydrochloric acid, the acidity of the stomach contents, at the time of examination, was less than on the other days, which paradox is explained by the fact that hydrochloric acid prevents fermentation, and, therefore, lessens the amount of organic acids, especially the lactic, on which substance largely depends the acidity of the stomach in cases of carcinoma of that organ.

In 8 of the 11 remaining cases, 120 analyses failed to find either free hydrochloric acid or digestive power. In the remaining 3, there was found, at first, a very weak hydrochloric acid reaction and feeble digestive power. They were, therefore, regarded as beginning cases of carcinoma. Later, free acid was no longer found.

From these observations Riegel concludes that, in the gastric juice of a cancerous stomach, as a rule, both free hydrochloric acid and digestive power are absent, and that, on the other hand, if, in any case, free hydrochloric acid and normal digestive power are present, carcinoma may be excluded in spite of the most decided symptoms of that disease. He denies having ever asserted that the mere absence of hydrochloric acid from the gastric juice compels the diagnosis of gastric cancer, but believes himself to be the first to have demonstrated the absence of hydrochloric acid in other affections, such as amyloid disease of the mucosa, toxic gastritis, and continued reflux of the bile.

A search for enlarged lymphatic glands should always be made in cases of suspected cancer of the stomach. Troisier, of France, has recently called attention to the diagnostic importance, in this disease, of enlargement of the supraclavicular glands, a fact previously noted by Henoch, in 1863. It is stated by Renault (*loc. cit.*), that Jaccoud always examined the glands of the inguinal region in cases of gastric cancer. Enlargement of the supraclavicular glands has also been observed in cancer of the œsophagus, of the lung, of the pleura, and even of the uterus; but in the absence of symptoms of disease of those parts, it is confirmatory of the symptoms of cancer of the stomach.

Certain hæmatological researches of Quinquaud, are of undoubted value with reference to the diagnosis of gastric carcinoma. Occupying himself particularly with the differential diagnosis between dilatation of the stomach caused by cancer, and simple dilatation, he found, in the former, a much greater diminution in the amount of hæmoglobin in the blood. In health there are to every 1000 parts (grammes) of blood 125 of hæmoglobin, capable of absorbing 240 cubic centimetres of oxygen. In simple dilatation the figures representing the amount of hæmoglobin and its power of absorbing oxygen are 80 and 174, while in dilatation caused by cancer, they do not surpass 52 and 100. With this reduction in the amount of hæmoglobin, the corpuscles are correspondingly reduced in number, and frequently assume the characters, increased size, and altered shape, of the blood of pernicious anæmia.

Excuses for failure to make a diagnosis in cases of latent gastric carcinoma are only admissible when all the means to this end have been employed with negative results.

Leaving out of view the stomach symptoms proper, which are often misleading, it is believed that a chemical and digestive test of the secretions of the organ, a proper examination of the blood, a careful search for enlarged glands and cancerous cutaneous nodules, and, finally, a quantitative estimation of the amount of urea in the urine, will furnish facts sufficient for a positive expression of opinion in every case of real or supposed gastric carcinoma.

With reference to the excretion of urea, Rommelaere, of Brussels, held the opinion that cancer was always present when the amount, for twenty-four hours, was below 150 grains; and, although it has since been shown that figures as low may be reached in other states of inanition, the fact, when existent, has a decided diagnostic value.

For an excellent collocation and digest of our present knowledge of gastric cancer, with special reference to its diagnosis, the reader may consult with advantage, the already quoted article of Renault.

SALOL.

ALTHOUGH the coal-tar group has, as we have often remarked before, seemed an inexhaustible storehouse of medicinal substances, we have had lately introduced into general use a substance known as the salicylate of phenol, or salol, which differs from most of the other drugs of its class in that it is composed of two derivatives of coal tar, namely, carbolic and salicylic acids. Salol was first introduced to the profession by Sahli, in Berne, in April, 1886, and has since been very generally tested at the bedside.

Perhaps the most general consideration of its virtues as yet published is that of GEORGI, in the *Berliner klin. Wochenschrift*, 1887, Nos. 9, 10, and 11, who unqualifiedly recommends its use in a large number of different diseases, particularly those connected with a rheumatic taint. He also believes it to possess marked antipyretic power in all of the ordinary fevers, and declares that as an antiseptic it surpasses most of its competitors by reason of its power and lack of disagreeable odor. It would be impossible here to enumerate all the conditions in which he has found it of value, and the very multiplicity of these conditions would throw reasonable doubt over its worth, but for the fact that other observers have established some of his assertions as facts.

PERIER and PATEIN, in the *Revue de Chirurgie*, of July 10, 1887, have recorded favorable result when using salol as a substitute for iodoform as a surgical dressing. Thus in the case of a man suffering from an extravasation of urine, with gangrene of the part, iodoform was used as a dressing for about six weeks without marked improvement, but as soon as salol was substituted healing took place rapidly. In the case of an amputated finger, healing took place by first intention when salol was used as the dressing, and these observers think it a substance of no small value.

When given internally the dose is usually from 15 to 30 grains, and Sahli has taken as much as 120 grains without producing any ill results, other than slight ringing in the ears. Georgi has also found it useful in the form of a wash for stomatitis and erysipelatous inflammations, and, altogether, the reports made upon this drug so far are so encouraging that it certainly deserves at least a fair trial by the profession in general.

CONSERVATIVE MIDWIFERY.

SUFFICIENT time has elapsed since the introduction of antiseptics in midwifery for the extreme and its reaction to have had their place, to be succeeded by the position of the safer middle ground. Thanks to the studies of those having the principal maternities of the world in their charge, we are now able to estimate the value of different treatments of the puerperal state, and deduce rules for the individual practitioner. No matter what the prejudices of the individual may be, the study of thousands of puerperal women by competent observers must yield facts whose import is binding upon all who take the responsibility of the care of human lives.

In the *Deutsche medicinische Wochenschrift*, No. 25, LEOPOLD, of Dresden, states the results obtained in a year's practice in the Frauenklinik, where, from May, 1886, to May, 1887, 1403 women were confined, among whom there was not a single case of septic infection contracted in the clinic. Among the last 500 confinements there was but a single case of the sequelæ of puerperal complications, and that a mild case of parametritis. The total mortality was 1.2 per cent. from all causes, and seven Cæsarean sections were among the operations performed. These results were obtained by thorough cleanliness; by the use externally of 1 : 4000 sublimate solution to disinfect the woman approaching labor. The greatest stress is laid upon the disinfection of those who examine puerperal cases. Most important is considered the thorough cleansing of the hands, nails, and forearms for five minutes with brush, soap, and warm water. Then follows cleansing in warm 1 : 3000 sublimate solution with brush and soap, and, finally, immersion for half a minute in 1 : 1000 sublimate solution. Especial stress is laid upon the soap and water cleansing. In this clinic practical instruction is given constantly. Injections and all interference with the patient are resorted to as seldom as possible.

In *Le Progrès Médicale*, No. 25, BUDIN reports a year's service at the Paris Charité. Among 1349 cases there was a total mortality of 1.55 per cent.; from septic infection 0.29 per cent. Corrosive sublimate, 1 to 2000, 3000, and 4000; boric and carbolic acids and iodoform are used. Students and midwives are instructed.

In the *Archiv für Gynäkologie*, Band xxx. Heft iii., CREDÉ, of Leipzig, expresses his decided convictions in favor of non-meddlesome midwifery, and bases his belief on the critical study of 8000 puerperal women. He expresses his view that what is needed is a rule of practice under all circumstances the safest in hospitals or dwellings. He cites 2355 cases with 0.3 per cent. mortality from sepsis. He lays stress upon preventing loss of blood as far as possible; on thorough disinfection of all which has to do with the patient; and on thorough antisepsis when interference is demanded. Regarding vaginal and intrauterine douches, he remarks, "The statement made in so many case histories that the patient's condition became worse '*in spite of*' antiseptic vaginal and intrauterine injections diligently used would be more correctly rendered in many cases if the word '*because*' was substituted for 'in spite of'". He reports a septic mortality of 0.6 per cent. in the Poliklinik, where the conditions are essentially those of private practice, and he indicates this as what, in our present knowledge, in private practice might be expected. He does not consider increased body temperature and pulse-rate, without decisive symptoms, as indicating disease, and thinks the profession and laity far too readily frightened by this cause. He advises practice in *external* examination by palpation; internal examination *almost never;* restriction of manipulation of lying-in women by students. He considers it of the greatest importance to puerperal women that "Their internal organs of generation be left entirely undisturbed for the first eight or nine days after parturition (neither examined, injected, nor in any way manipulated)." In the presence of disease or injury at parturition they are not to be disturbed while the disease lasts, or while wounds and lacerations are not yet healed.

It is only ripe experience which can give an honest thinker convictions such as these. The great restriction of vaginal manipulations in midwifery is an innovation in the teaching of the present day, which encourages students to depend upon it for diagnosis. There is no question of the soundness of the views expressed by the authorities cited, and insistence upon the thorough performance of the

essentials of antisepsis and thorough knowledge of the anatomy and physiology of the parturient will banish injurious interference, and are the duty of practitioners and teachers.

THE fifty-fifth annual meeting of the British Medical Association convened at Dublin, on August 2d. A large and enthusiastic attendance is reported, and the proceedings were of unusual interest. The address in medicine, by Professor Gairdner, of Glasgow, and the address in surgery, by Professor Hamilton, of Dublin, with the historical retrospect by the President, Professor Banks, of Dublin, were especially interesting and valuable. The Association now numbers over 11,000 members, and the total circulation of its Journal exceeds 13,000; its affairs are in a condition of the highest prosperity.

REVIEWS.

A MANUAL OF TREATMENT BY MASSAGE AND METHODICAL EXERCISE. By JOSEPH SCHREIBER, M.D., Member of K. K. Gesellschaft der Aerzte of Vienna, etc. Translated, with the Author's permission, by WALTER MENDELSOHN, M.D., of New York. 8vo. pp. 285. Philadelphia: Lea Brothers & Co., 1887.

MECHANO-THERAPY, since the dawn of rational pharmacology, is a recent science; and the number of new works which have lately appeared on this subject are a measure, in part at least, of its importance and of the consideration which is bestowed upon it by the leaders of therapeutic research. The work before us is one of five which have been issued from the German medical press alone during the last five years. It is probably the most practical, and it is certainly better illustrated than any of its predecessors. Its aim is to elucidate the mechanical methods by cases which happened in the experience of the author, and to give such practical hints as will facilitate the execution of the various manipulations. After discussing the physiological effects of massage and of gymnastics, it defines the diseases to which mechano-therapy is applicable. Among the more common diseases which are amenable to its influence are sciatica, cervico-brachialgia, trigeminal neuralgia, myalgia, torticollis, sprains, chronic catarrhal gastritis, phthisis, neurasthenia, etc.; a number of which are illustrated by the citation of interesting cases.

It is to be regretted that the author does not even refer to probably the only scientific physiological work which has been done to show the effects of massage on the exhausted muscles of frogs. We allude to the interesting experiments which were performed by Zabludowski in the Berlin physiological laboratory, under the direction of Prof. Kronecker, and which were published as long ago as 1883.

With this omission, the work, so far as we can see, is one which meets every indication, and we can frankly commend it to the profession.

SOCIETY PROCEEDINGS.

AMERICAN NEUROLOGICAL ASSOCIATION.

Thirteenth Annual Meeting, held at Long Branch, N. J., July 21, 22, and 23, 1887.

(Specially reported for THE MEDICAL NEWS.)

(Concluded from page 164.)

FRIDAY, JULY 22D.—MORNING SESSION.

DR. ISAAC OTT read a paper on

THERMOTAXIS.

He called attention to the increase of temperature upon nerve irritation, and after the administration of atropia, and to the rise of temperature in cases of tetanus and convulsions.

DR. SPITZKA mentioned two cases of chorea, the temperature in one case rising to 104° and in the other to 107°; he could not account for the rise except by the strong muscular action exhibited. He had also seen a fatal case of chorea in which the temperature was 103°.

DR. C. L. DANA reported

A CASE OF ANENCEPHALIA ILLUSTRATING THE SENSORY TRACT.

The case was that of a male child born at full term, weighing 8 or 9 pounds; there was no deformity, except that the head was rather peculiar, being very long and narrow; the bones were freely movable, the eyes were kept closed; the child died on the second day. At the post-mortem a yellowish fluid squirted out from the brain, the first nerve was not fully developed, the arterial supply was inferior and undeveloped in some of its branches, the pons Varolii was small, as was also the spinal cord.

DR. GEORGE W. JACOBY, of New York, presented a paper on

THE TREATMENT OF NEURALGIAS BY MEANS OF INTENSE COLD.

He said that our methods of applying cold therapeutically have been revolutionized by the introduction into use of chloride of methyl. Since Debove first recommended this agent in 1884, he had given considerable attention to the therapeutic action of the various refrigerants, and had come to the conclusion that we possess only two which can be easily and practically utilized—the chloride of methyl and fluid carbonic acid. By chloride of methyl he has treated five cases of trigeminal neuralgia; three of from one to five weeks standing, one of six months, and one of twenty-seven years duration. In all the pain was entirely relieved after the first application. In two of the recent cases the pain returned; a second application was made and a cure resulted. In one of the other cases the pain was so much ameliorated after four applications that the patient discontinued treatment, although not entirely well, but in the fifth case he was able only to obtain relief from pain, and, although six applications were made there was no sign of permanent improvement. His conclusion is that we have in the chloride of methyl a reliable analgesic, which does not affect the general condition of the patient, and that it is invaluable in the

treatment of neuralgias for the immediate relief of severe pain.

He has used the carbonic acid in ten cases of sciatica, and he finds that it is a good substitute for the chloride of methyl so far as relieving the pain is concerned, but that its curative effect is not so great.

DR. CHARLES K. MILLS presented

NOTES OF SOME CASES OF MULTIPLE NEURITIS (OR MYELITIS) OF SYPHILITIC ORIGIN, WITH REMARKS ON THE DIFFICULTIES OF DIAGNOSTICATING MULTIPLE NEURITIS FROM SOME FORMS OF MYELITIS.

During the ten years he had been Neurologist to the Philadelphia Hospital, the attention of Dr. Mills had been frequently directed to a certain class of paralytic cases, in which a clear history of either syphilis or of chronic alcoholism, or of both, had always been present. Syphilis and alcoholism were so frequently factors in the production of the organic nervous affections observed at the Philadelphia Hospital, and they were so often conjoined in the history of the same case, that it was sometimes difficult to separate such cases into two subdivisions, one of which represented a type clearly syphilitic, and the other one clearly alcoholic. Sometimes, however, he had been able to do this. He had for presentation the notes of three cases in which the past history of the patient, or the results of treatment, or both, indicated a syphilitic origin of the disease. With reference to alcohol, he said that the cases of the same class clearly due to alcohol alone, presented almost identically the same clinical features as those shown by the purely syphilitic cases. Purely alcoholic cases did not, however, so well respond to specific treatment, and sometimes would not respond at all to such treatment. During the last ten years he had seen at least a dozen cases similar to those to be detailed, cases, the majority of which recovered under specific treatment, with the help of massage, electricity, tonics, and time.

Many interesting questions might be suggested by a study of cases such as these. He had, for instance, often been at a loss, from any known rules of diagnosis, to differentiate clearly their local pathology. They presented such phenomena clinically, that, he had no doubt, in an era of "multiple neuritis" they would be classed as examples of that affection, although almost all, if not all, the symptoms could be easily traced to a spinal lesion. These cases, among others, had led him to a conclusion which he regarded as philosophical, and which he believed was borne out by the facts, namely, that in practice we had frequently not multiple neuritis alone, and not myelitis alone, but a concurrence of these inflammatory conditions in the same case. At a meeting of the Philadelphia Neurological Society, held November 22, 1886, he had presented some remarks on this concurrence, and also upon the concurrence of encephalitis with neuritis or myelitis, coming among other conclusions to the following: We may have—1. Cases of multiple neuritis, pure and simple, but such cases are rare. 2. Cases in which the multiple neuritis is associated with myelitis.

Dr. Mills related the histories of three cases, and then said he desired to elicit a discussion on the differential diagnosis of multiple neuritis from some forms of myelitis, and especially diffuse myelitis and poliomyelitis. The differential features given by Chapin, Starr, and others, he regarded as insufficient. Some of them were misleading. Common both to multiple neuritis and myelitis of the forms indicated were atrophic paralysis, lost knee-jerk, and degeneration reactions, according to the best observers. Pain and tenderness, severe in character, distinctly localized to nerve-trunks and muscles, and the absence of symptoms of paresis or spasm in the bladder and bowels seemed to be the most definite marks of multiple neuritis, but could even these be regarded as positive, or, at least, absolute? It was certainly fallacious to decide in favor of neuritis because of gradual onset, because the cases got well, because the paralysis was progressive and ascending, or because of the presence of numerous and persistent sensory manifestations.

When the nerves and central organs were both involved it was difficult to say which was first involved; there are some forms of these diseases which are painless and others where the pain is great. He considered there were cases where it was impossible to discover whether the disease were central or peripheral.

DR. EDES said that he reported a case some years ago in which he found symmetrical lesions in the cord; there was the usual amount of asthenia with rapidly advancing paralysis and atrophy below the knees and elbows; the case resulted fatally. He thought Dr. Mills was right, and that these two things may coexist, but whether the degeneration of the cord was owing to neuritis he would not be certain. He thought the tendency was to call these cases neuritis.

DR. PUTNAM remarked as to the connection of neuritis and disease of the anterior columns of the spinal cord, the pain felt in poliomyelitis is really of neuritic origin; he made a post-mortem in a case in which the pain was intense with the paralysis at the onset of the disease, although the nerves were not examined he could conceive that there was no doubt that they were affected; the spinal cord was affected throughout the columns, but confined to the gray matter. He had seen cases of pain with a loss of sensibility where the cord appeared to be healthy, but where the brain had spots of softening, and the arteries were greatly thickened in the central nervous system. As Dr. Mills had suggested, the different types differ so strongly that we have to conclude we are dealing with a symptom of disease, and that the spinal cord and peripheral portion are related in some way.

DR. LLOYD suggested the use of electricity as a means of diagnosis in these cases.

DR. STARR did not think this means could be depended upon, as the intensity of the disease was so varied. He thought a great many cases of poliomyelitis begin without any sensory symptoms at all, and where they do occur at the beginning, the question comes in as to whether it is not neuritis. He did not remember seeing any cases in which the cord was affected equally on both sides, one arm would be affected more than the other and so it would be with the legs. In multiple neuritis both sides were affected similarly; as a rule, cases that he had seen during the past year followed out that idea. He considered it a mistake to call all cases that recover neuritis; neuritis is not always favorable in its course, but it is more favorable than the other; there is a form of subacute poliomyelitis which may correspond with neuritis, pain and tenderness being points of great value in diagnosis.

DR. DANA considered alcoholic paralysis to be multiple neuritis; in these cases he had found the greatest variety of symptoms; in those cases of alcoholic neuritis we find neuritis alone, and in myelitis, myelitis alone, but cases have been reported where they have been combined.

DR. MILLS by no means asserted the constant coexistence of the two diseases, but his desire was for the Association to discuss the different diagnostic points; he did not think electricity, as suggested by Dr. Lloyd, would be of great value; he felt convinced that poliomyelitis began with sensory symptoms at times, but that the cord in these cases was attacked by a more general inflammation which limited itself in time to the horns.

DR. E. D. FISHER, of New York, reported

A CASE OF BULBAR PARALYSIS

in a young married woman who had been under his care for a year and a half. The expression of the face then was characteristic of the disease, the lower lip hanging down and saliva flowing from the corners of the mouth; the tongue was small and atrophied and she could swallow with difficulty; examination of the larynx was almost an impossibility; reflexes were normal, the disease being confined to the hypoglossal and lower portion of the facial nerve; speech at length became utterly impossible. The mind was not affected, but the patient was very excitable and emotional. Emaciation then commenced; deglutition being extremely difficult, her food was confined to fluids. At night severe attacks of dyspnœa appeared, the patient being unable to cough. At the autopsy the floor of the fourth ventricle, the region over the hypoglossal nerve, was small and pale, the specimen after hardening showing an almost entire disappearance of the cells; the facial nerve was not involved in a marked degree.

He thought the disease was probably induced by a defective blood supply in its early stages, and increased supply of blood to the parts later, but of a non-inflammatory nature, its purely local character being due to the arterial distribution of the parts.

The Association then approved of the scheme for the

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS,

and Dr. Landon Carter Gray was appointed its representative in the Executive Committee of the Congress, and Dr. Charles K. Mills alternate.

The following were then elected

OFFICERS FOR THE ENSUING YEAR.

President.—Dr. James J. Putnam, of Boston.

Vice-Presidents.—Drs. Wharton Sinkler, of Philadelphia, and B. Sachs, of New York.

Secretary and Treasurer.—Dr. Graeme M. Hammond, of New York.

Councillors.—Drs. George W. Jacoby, of New York, and Robert T. Edes, of Washington.

The Association then adjourned.

CORRESPONDENCE.

LETTER FROM LEIPZIG.

Sänger's Performance of Laparotomy—Lacerated Cervix in Germany.

Although the months of July and August are held as holidays in Germany in many departments of the universities, there is yet much to be seen in the line of surgery, and while the auditoriums are not so crowded with students, the professors still continue to operate, and, with the exception of a short holiday, which is very apt to fall in August, they devote much time and courteous attention to their visitors, especially if they are specialists seeking information. Within an hour after my arrival at Leipzig I was fortunate enough to see Dr. Sänger perform two laparotomies, one for tumor of the gall-bladder, and the other for cystic tumors of the broad ligament and ovaries.

The *technique* was perfectly aseptic, and conducted in a manner with which we are all now familiar, insuring the regular and perfect recovery which usually follows.

The gall-bladder had formed a large retention cyst, the stoppage being due to an unknown cause. This cyst was first stitched carefully to a short vertical incision at the outer margin of the right rectus by the navel, and was next, after the formation of close adhesions shutting off the remainder of the peritoneum, which occurred in six days, opened by Paquelin's cautery.

One of the cystic tumors was parovarian, the size of a small cocoanut, and the other a small dermoid cyst of the left ovary. The incision was made long enough to slip the larger cyst out intact; the pedicle was tied by transfixion, and again a separate ligature was thrown around the whole stump. Both stumps were treated in this way, and the cut surfaces carefully burned with Paquelin's cautery. This last procedure is followed as an antiseptic measure and one greatly limiting the amount of exudation.

I was particularly interested in the method of tying, as it is exactly that which my own experience has taught me to adopt. The dangers of immediate hemorrhage in a tie which pulls up the broad ligament in the shape of a cone are greater than is generally believed to be the case, and a transfixed tie seems peculiarly liable to inversion. This may result more from a tendency to cut the stump cup-shaped rather than from any mechanical difficulty. I am, however, sure that the two ties combined afford the utmost possible safety in the case of a broad pedicle tending to roll out.

The tie used by Prof. Gaillard Thomas is employed in Germany also, and though in some respects similar, is practically different, the method here used possessing a distinct advantage in that the last tie is accurately applied in exactly the most convenient place for the thread to hold securely, and is conveniently added just before dropping the pedicle.

Our workers at home will be both surprised and pleased to hear that "laceration of the cervix uteri" has at last found here an advocate in Dr. Sänger, who fully understands the subject in all its bearings. Although this is one of the minor operations in gynecology, and one indeed which at home has been much injured by the *furor operativus*, one first realizes in coming abroad what a world of good the operation is capable of doing, and what a vast field is open for it in Germany, England, France, and Italy. While last year I was shown well-marked lacerations with extensive eversion of the cervical mucous membrane labelled "erosion," I now see cases which have been very neatly operated upon and *cured*, and I see still others in process of preparation for operation, and hear remarks upon the *rarity* of real erosion.

The same misunderstanding is general in Great Britain, and was especially apparent at the meeting of the Gynecological Section of the British Medical Association, at Brighton, in 1886.

Nothing better defines the great difference between the practice of forty years ago and to-day in America, and the great steps we have taken in the advance in practical surgery, than this very subject of lacerated cervix. Twenty years ago, the "erosion" which was so universally found and so invariably accompanied by other signs of disease, was treated directly by cauterizing and destructive agents of various sorts; and one saw in consequence (in fact, sees yet) the well-known small, hard, gristly cervices, in which the canal could scarcely be found, or even penetrated by a bristle. Yet it is a tribute due to our predecessors to acknowledge that, on the basis of a false pathology, they still often attained by their practical genius excellent results. By the nitrate of silver method, especially, the great, spongy, infiltrated lips were thus destroyed and shrunken, and the patient often relieved. Now the tedious, uncertain, and, in case of consecutive pregnancy, even very dangerous, method has been, in America, replaced by the rational preparatory treatment and the rational operation—thanks to Dr. Emmet; and the stimulus this one simple procedure has given to the present careful investigation and rational treatment of all other gynecological subjects, cannot be overestimated.

In Germany the matter has, however, taken another and truly a very remarkable form. In the first place, the relation between epithelial proliferation and cancer everyone knows, and the tendency of epithelium to grow in places where it is not normally found, or to invade tissues more deeply than normally, is naturally to be dreaded. In the second place, on the "erosion" (lacerated cervix) we find glandular epithelium, which belongs *inside* the cervix, extending *far outside* toward the vaginal wall (in consequence of eversion). Couple these two facts with a third, the frequency of cancer of the cervix, and we have in this apparently misplaced epithelium the simplest and most reasonable explanation possible of the origin of the *epithelioma cervicis*. Here, again, we must pay a tribute to the practical genius of our coworkers, relative to their treatment of the difficulty, holding, as they do, such etiological views. The operation prescribed for such an "erosion," which "may be now just passing into cancer," is *amputation*, and that is the reason why we see so many amputations of lacerated cervices in Germany. But this *amputation* is usually only one *in name*, being in reality a skilful *resection* of the diseased mucosa, such as we might ourselves occasionally practise, where the mucous membrane is infiltrated and diseased beyond hope of rejuvenation. The cervix is, by this procedure, somewhat shortened, but never cleaned off to the extent I have seen in amputations by the wire cautery.

A few students are in Leipzig attending the summer course in the Entbindungs Anstalt, under Prof. Zweifel, with the valuable assistance of Dr. Döderlein; others are availing themselves of the opportunities afforded in the Poliklinik, under Dr. Sänger, where a rich material and the wonderfully clear teaching of one of the best gynecologists in the world give all an inquisitive mind could ask.

HOWARD A. KELLY.

LEIPZIG, July 19, 1887.

IPECACUANHA IN LABOR.

To the Editor of THE MEDICAL NEWS,

SIR: Under this title an editorial in THE NEWS of July 23d, contains the following: "Carregei, in the *Revue Médico-Chirurgicale des Maladies des Femmes* of May 25th, states that from the remarkable influence ipecacuanha has over uterine hæmorrhage he has been led to employ it as an oxytoxic." And it is there remarked that the practice is by no means new, though the quantity of the medicine is much less (a grain and a half to three grains) than that heretofore employed; and reference is made to the use of the nauseating influence of ipecac in a rigid os thirty years or more ago, with the comment that it will be a great gain if so simple a remedy in such a dose will shorten the time and diminish the intensity of the suffering.

This is a curious illustration of a certain periodicity that sometimes involves and reiterates medical knowledge, and especially of the failure of a prophet to receive honor in his own country.

In the *New York Medical Journal* for November, 1878, Dr. John H. Carriger, of Knoxville, Tenn., published an interesting article, illustrated by cases, on "The Use of Ipecacuanha in Labor," where he reached the conclusion that it is "a potent and reliable uterine motor stimulant," and that its influence over uterine hemorrhage is not, as sometimes taught, "due to sedation upon the heart and arteries, . . but to its power of coördinating uterine action and stimulating tonic contraction." He believes that it exercises "coördinating influence over that condition of the uterus in which we have irregular uterine action," and further that under its use there is "a general contractility of the non-striated tissues, [and] a contraction of the capillaries as well as of the uterine tissues." He gave in labor cases two grains every thirty minutes, and had followed that practice since 1851.

This paper does not appear to have attracted much attention in this country, but in the *Virginia Medical Monthly* for February, 1880, there appeared as an original translation this extract from the *Revue des Sciences Médicales* (number and page not given): "Dr. Carriger employs ipecac for its speedy action in hemorrhage during and after parturition. He says it is a powerful drug in stimulating a weak labor and in relaxing rigidity. It also hastens labor by increasing the pains. A long labor has been speedily terminated by giving from 10 to 20 centigrammes (15 to 30 grains) of powdered ipecac." Here there is an evident error in misplacing the decimal point and then translating from that—the true dose being 1.5 to 3 grains.

I have the impression that I have seen in another American journal, a translated extract on this subject from the French of "M. Carriger," but the reference is mislaid.

In the *New York Medical Record* for June, 1882, Dr. L. F. Pitkin writes that having had his attention drawn about two years before by "an article written by a Southern physician," he has used ipecac "in several cases where the pains were irregular and the os rigid and undilatable, and always with benefit." He thinks it has a specific effect on the rigid os uteri, softening and relaxing its fibres as well as having a coördinating influence on the irregularly contracting uterine muscles,

causing them to act in harmony." He reports the details of one case where he used five grain doses with success.

An examination of the original in the *Revue Médico-Chirurgicale* makes it evident that Drs. Carregei and Carriger are identical and that the French journal is still using the material of the Knoxville physician. It would be interesting, if practicable, to follow the course of the quotation to and fro, but it would certainly be all traced in the end to the single authority.

My own interest in this matter lies in the fact that in 1876 I published my belief that ipecac is essentially a stimulant to the organic nerves and that its emetic qualities are incidental—an opinion which Dr. Carriger appears to have reached independently. In a very limited obstetric practice I have since followed his advice and always with satisfactory results.

Renewed attention is now invited to this use of two-grain doses every twenty or thirty minutes when the os is rigid and the pains irregular and ineffective. Under the circumstances it will almost certainly be found a trustworthy uterine stimulant, and by a wider experience the exact therapeutic value of the drug may be established. Respectfully,

ALFRED A. WOODHULL,
Surgeon, U S Army.

FORT LEAVENWORTH, KAN.,
August 10, 1887

NEWS ITEMS.

RAGS AND INFECTIOUS DISEASES.—From the report on the "Transmission of Infectious Diseases Through the Medium of Rags," by Dr. C. F. Withington, incorporated in the Eighteenth Annual Report of the State Board of Health of Massachusetts, we take the following conclusions:

1. Smallpox has been transmitted through the medium of rags in a certain number of cases, small in proportion to the whole number of persons who handle rags, but absolutely numerous enough to show that unvaccinated workers in rags are exposed to an actual, if not imminent, danger of infection from this source.

2. The source of this infection is more frequently domestic than foreign rags, though the disease has been caused by the latter. This possibility of infection through imported rags accords with what is known of the tenacity of life of the variolous poison.

3. Among the rarer means whereby cholera is transmitted, are textile fabrics infected with choleraic discharges. There is evidence that clothing from cholera patients, and possibly clothing merely packed in an infected locality, has, when transported to a distance and there unpacked, caused the disease in those who have handled it, thus starting a fresh cholera focus. A proper distinction exists between clothing, on the one hand, recently removed from the body and again not long after to be put on to the body; and rags, on the other hand, which, if transported to this country, are certain to have undergone a carefully discriminative sorting and drying, and to have spent a considerable time in warehouse and on shipboard.

4. The statement that cholera has been transmitted by paper rags, rests upon a solitary case, of which the details are not complete, and on the reliability of which some of the highest authorities on cholera have cast doubt. If the case be accepted, it is one of infection by *domestic* rags, carried only fifty miles from their place of collection.

5. An epidemic affection known as "rag-sorters' disease," appears to have broken out on three or four occasions in European paper mills. It was probably, though not certainly, the disease called anthrax.

6. Authenticated instances are not to be found in which the other infectious diseases—typhus and typhoid fevers, scarlet fever, measles, and diphtheria—have been transmitted through rags; though it is to be said that such evidence, supposing the fact to exist, would be very difficult to get. Neither do the mortality tables, as shown by registration reports, show a preponderance of deaths from these diseases in the paper-making towns.

7. There is no evidence to show that rag-sorters as a class are, except for occasional cases of smallpox and a certain amount of pulmonary irritation from the dust of improperly ventilated rooms, less healthy than other persons engaged in indoor manual occupations.

8. Despite the fact that cholera is not known to have ever been conveyed to this or any other country in foreign baled rags, it is a reasonable precaution to prohibit the landing in any United States port of rags gathered in epidemically infected localities, in view of the possibility that among such rags there may have been thrown articles of infected clothing which have not been sufficiently dried and aired, or have not occupied enough time in their transportation to be devoid of danger. Such prohibitions should be limited to the time and place of epidemic infection; but all necessary precautions should be taken to make sure that rags shipped from a healthy port were not gathered or baled in an infected place.

9. As the only safeguard against the occurrence of smallpox among operatives, paper-mill owners, whether "incorporated companies" or not, should make evidence of successful vaccination an absolute prerequisite to the employment of any person in the mill, and a revaccination at regular intervals (not merely on the occurrence of an epidemic in the neighborhood) a condition of being retained in their employ.

10. As the contagion of smallpox, phthisis, and perhaps other diseases, is capable of being inspired when the particles carrying it are suspended in the air in the form of dust, and as dust, even when it carries no contagion, is irritating to the respiratory passages, every mill should have, in connection with each table in the rag room and in the dusting room, a ventilating system, preferably consisting of flues connected with an exhaust fan, so that the dust, as fast as it is disengaged, may be withdrawn from the air. The success which attends the working of such an apparatus in some mills where it is in use, is a sufficient warrant for its general introduction.

11. A law similar to that of Great Britain, imposing a penalty on the selling or giving away of infected rags from persons sick with any dangerous disease, seems desirable. Public institutions and private householders should be obliged (and not as at present, simply advised) to insure the disinfection of the more valuable articles, and the destruction by fire of all rags that have been thus exposed.

12. As domestic rags comprise more than half those used, and represent a still larger proportion of the infection likely to be carried, it follows that they should par-

ticipate in whatever disinfection is thought necessary. This fact points to the paper mill as the proper place for making such disinfection. The sulphur process would, doubtless, afford the least embarrassment to the manufacturer; the bales being opened in a tightly closed room, the rags being spread on racks, and sulphur burned in the proportion of two pounds to each one thousand cubic feet of space. The introduction of steam under pressure, the rags being similarly disposed, would be the most effective disinfection possible, but would dampen the rags to their injury, unless the moisture were dried out at once with a current of hot air.

HOSPITALS FOR CONTAGIOUS DISEASES.—We have several times had occasion to call attention to the importance of providing special hospitals for the treatment of those forms of contagious disease in which isolation and disinfection are of special importance. The Municipal Council of Paris has been leisurely investigating this subject for the last three years through a committee, in behalf of which Dr. Chantemps has recently presented a report which is of interest in this connection.

It is certainly time that Paris should take some steps to diminish the proportion of contagious disease which seems of late years to have been increasing within her boundaries. The only special accommodation for such diseases which she now has consists of two barracks for smallpox, one connected with the hospital St. Antoine, and containing seventy-two beds, the other at the hospital St. Louis, containing sixty-four beds.

Nor can the methods actually in use in Paris for dealing with contagious disease be considered as at all satisfactory.

Theoretically, there is a very good set of rules and regulations for such cases, but practically they are not carried out. For example, the total amount expended during 1885 for the disinfection of infected localities was $163. Disinfectants are stored at the police stations and in the municipal laboratory, but they are not used.

Dr. Chantemps proposes that two special smallpox hospitals shall be constructed, one for the northern and the other for the southern portions of the city, the two to contain 300 beds. It is also advised that two special wards for diphtheria cases be arranged in the two chief hospitals for children, at which also separate pavilions for scarlet fever and measles should be provided. Two stations for ambulances to convey contagious cases to hospitals are to be provided, each to have six separate compartments, in each of which two ambulances are to be kept. The vehicles in each division are used for cases of one disease only, the diseases thus provided for being smallpox, measles, scarlet fever, diphtheria, whooping-cough, and miscellaneous skin affections. There are also to be provided two disinfecting stations, with the usual apparatus for the use of superheated steam, etc. It will be seen that what is recommended is really needed for such a city as Paris, but it is doubtful whether anything will really be done until the stimulus of an epidemic compels attention to the matter.

While most of our large cities are better provided with means for circumscribing and destroying infection than Paris is, and make more use of them, it is, nevertheless, true that the majority of our cities of from ten to forty or fifty thousand inhabitants have no sufficient hospital accommodation, means of transportation, or disinfecting apparatus for dealing with contagious disease, and that until they are provided with these the efforts of health officials to control the spread of such disease must be of comparatively little use.—*Sanitary Engineer*, July 16, 1887.

PASTEUR'S REMARKS UPON HIS RECENT ELECTION.—On the occasion of his practically unanimous election to the Permanent Secretaryship of the Academy of Sciences, Pasteur said that he wished "to devote what remains to him of existence to two purposes: one, to institute researches and to train students full of promise in a manner worthy of French science; the other, to follow attentively the work which the Academy institutes and encourages."

THE DECOMPOSITION OF WOOD DEPENDENT UPON LIVING ORGANISMS.—*A propos* to our knowledge of decomposition in animal tissues as caused by living organisms is the following, from the *Sanitary Engineer* of June 11, 1887:

Prof. A. H. Church, in a recent lecture on "Wood, Its Chemistry, Its Decay, and Its Preservation," thus alludes to the use of paraffine as a preservative of wood: "It is now believed that wood does not decay simply by the action of moisture and air, unless the germs of living beings are also present, and that is the reason why the three classes of materials which prevent decay have been found to be effective. Some of these agents altogether exclude air and water, and are termed hydrofuge substances. A coating of excessively hard paraffine, melting at a temperature of 150° Fah., excludes all the germs of those minute organisms, and prevents decay. Paraffine is absolutely indestructible, and is unaffected by alterations of temperature or exposure, consequently it offers one of the best materials for the treatment of wood in cabinet or joinery work; and although it slightly increases inflammability of the material for floors and parquetry, nothing is better than paraffine." He then mentioned substances which prevent the decay of timber which he termed of the poisonous class. "Air and moisture may be permitted to penetrate the wood, but by putting minute quantities of chloride of mercury, carbolic acid, acridine, cryptidine, or naphthaline into it, the timber will show no alteration, except that the coloring matter is changed, until the preservative substance has escaped. Then there are substances which are non-poisonous, and not hydrofuges, but which yet prevent decay and paralyze the organisms. A small quantity of the vapor of chloroform, and many other substances, are, without being actually poisonous, able for a time to prevent the decay of wood. On all grounds, therefore, the conclusion was reached that timber decays on account of the presence of living organisms, and not by direct chemical action."

PHOTOGRAPHY BY VITAL PHOSPHORESCENCE.—DR. JOHN VANSANT, in the *St. Louis Photographer* for July, 1887, calls attention to the curious fact that the kind of light given out by certain *animal organs*, and which evidently in its causation has some close relationship to the nervous system and vitality of the animal, and can bring about incipient decomposition in a haloid salt of silver. Moreover, it can do this through a sheet of glass of the usual thickness used for photographic nega-

tives, and, consequently, there is a possibility of producing by such light photographic positive prints.

The following experiment, copied from his notes, proves this: June 8, 1887. Just after dark, I took about a dozen fireflies (*Lampyris corusca*), which had been captured a few minutes before on the lawn, and inclosed them in a wide-mouthed vial of some three ounces capacity, having a piece of fine white bobinet (such as is used for ladies' veils) stretched over its mouth in place of a stopper. Inclosed thus, they would frequently emit the momentary flashes of greenish-tinted yellow light for which they are remarkable, though usually only one insect at the same time would flash. Every few seconds one or another would emit its light for a period which I estimated to average in each case about one-half of a second, and the frequency of the emissions could be increased by gently shaking the vial. When not flashing, the under surface of the three posterior segments of the firefly's abdomen, from which the light came, was scarcely at all luminous, but was simply of a bright yellow color. The flashing was plainly under the control of the insect, like its muscular movements. These fireflies are rather less than three-quarters of an inch long, and the segments which become luminous have, altogether, an area of only about one-eighth of an inch square. This flash is, however, quite bright, so much so that fine print can be easily seen when held close to it.

Repairing to my dark closet with the vial of fireflies, I placed it to one side, under cover, whilst I arranged and clamped a very sensitive gelatino-bromide of silver dry plate beneath an ordinary negative picture of a landscape on glass, as for contact printing.

The vial of insects was then inverted over the back of the negative, so that only the fine meshes of the bobinet and the glass of the negative with its gelatine film intervened between the firefly's light and the sensitive bromide plate. I counted the flashes, occasionally shaking the vial and sliding it over the negative, till fifty flashes had occurred.

The vial was then removed, the sensitive plate separated from the negative, and an attempt made to develop the latent image, if any existed. Alkaline solution of pyrogallol was used, and in a few minutes I had the pleasure of seeing a well-marked positive image of the negative picture appear, the plate being somewhat yellow stained, as if from too long an exposure. This was fixed in the usual way with sod. hypo sulph., and is now in my possession—probably the first picture ever *produced by the light emitted from a living animal organism.*

THE PROLONGATION OF HUMAN LIFE.—The last report of the Registrar-General in England furnishes fresh evidence of the steady progress which is making in the prolongation of human life, especially through the influence of the sanitary measures adopted during the last thirty years. The death-rate for 1886 was 19.3 per thousand of the population, which was lower than that recorded in any previous year since the registration system was started in 1837, with the two exceptions of 19 in 1885 and 18.9 in 1881. The mean annual death-rate for the six years since 1880 did not exceed 19.3, which was 2.1 below the mean rate between 1840 and 1880. This means that 339,000 persons in England and Wales were alive at the end of those six years who would have been dead if the rate of mortality which prevailed between 1870 and 1880 had been maintained. The reduction is largely accounted for by the falling off in the deaths from the principal zymotic or "filth diseases," which have sunk from an annual rate of 4.15 per thousand, between 1860 and 1870, to 3.40, between 1870 and 1880, and only 2.43 since 1880. The proportion of infant mortality has also been perceptibly diminished, falling from an average of 149 per thousand births, during the ten years preceding 1880, to 141 in the six years since then. The birth-rate itself last year was only 32.4, which is lower than in any year since 1848, and the natural increase of population by the excess of births over deaths accordingly shows a decline from 375,922, in 1884, and 371,520, in 1885, to 366,138 in 1886.—*New York Evening Post.*

NOTES AND QUERIES.

IS ANTIPYRIN A PROPRIETARY MEDICINE?

To the Editor of THE MEDICAL NEWS,

SIR: Please inform me, through the columns of THE NEWS, if antipyrin is a proprietary medicine or not? Also, if an ultimate analysis has been published, and, if so, what is its chemical formula? SUBSCRIBER.

BARRYVILLE, N. Y, August 12, 1887.

[The preparation and chemical composition of antipyrin are secrets, and it is manufactured under a patent.—ED.]

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT U. S. ARMY, FROM AUGUST 9 TO AUGUST 15, 1887.

MCKEE, J. C., *Major and Surgeon.*—Ordered for duty at Watertown Arsenal, Massachusetts.—*S. O. 181, A. G. O.*, August 6, 1887.

BROWN, H. E., *Major and Surgeon.*—Sick leave extended to August 6, 1887, on account of sickness.—*S. O. 184, A. G. O.*, August 10, 1887.

CLEARY, P. J. A., *Major and Surgeon.*—Ordered to Fort McDowell, Arizona Territory, instead of Fort Assiniboine, Montana Territory.—*S. O. 180, A. G. O.*, August 5, 1887.

MERRILL, J. C., *Captain and Assistant Surgeon.*—Ordered from Fort Klamath, Oregon, to Watervliet Arsenal, New York.—*S. O. 181, A. G. O.*, August 6, 1887.

WILSON, GEORGE F., *Captain and Assistant Surgeon.*—Granted leave of absence for fifteen days.—*S. O. 78, Department of Dakota*, August 8, 1887.

SUTER, WILLIAM N., *First Lieutenant and Assistant Surgeon.*—Ordered to return to Washington Barracks, District of Columbia, on the breaking up of the camp at Creedmoor, New York.—*S. O. 166, Division of the Atlantic*, August 10, 1887.

ANDERSON, C. L. G., *First Lieutenant and Assistant Surgeon.*—(Station, Whipple Barracks, Arizona Territory) Ordered to Fort McDowell, Arizona Territory.—*S. O. 81, Department of Arizona*, August 3, 1887.

HOPKINS, WILLIAM E., *First Lieutenant and Assistant Surgeon.*—Ordered from Angel Island, California, to Fort Mason, California.—*S. O. 184, A. G. O.*, August 10, 1887.

MACAULEY, C. N. B., *First Lieutenant and Assistant Surgeon.*—Promoted to be Assistant Surgeon, with the rank of Captain, by operation of law, August 10, 1887.

PILCHER, J. E., *First Lieutenant and Assistant Surgeon.*—Ordered from Fort Monroe, Virginia, to Fort Wood, New York Harbor, N. Y.—*S. O. 180, A. G. O.*, August 5, 1887.

DICKSON, JOHN M., *Captain and Assistant Surgeon.*—Died, August 8, 1887 (station, Fort Mason, California).

THE MEDICAL NEWS *will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.*

Local papers containing reports or news items should be marked.

Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

All communications relating to the editorial department of the NEWS *should be addressed to No. 1004 Walnut Street, Philadelphia.*